

THE

Desert

M A G A Z I N E



SEPTEMBER, 1944

25 CENTS

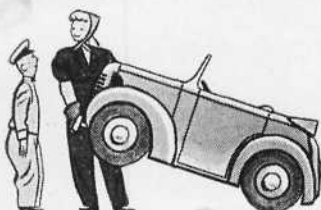
About my friend Philomel Murphy-

BY YOUR UNION OIL
MINUTE MAN

The other day, we'd just opened the station for business when in storms 380 pounds of the biggest, maddest woman I've ever seen. She's jammed into a little Austin about the size of an anemic gopher.

I start to smile and say "Good morning." But this dame climbs out of her kiddie car and holds up her hand—which looks like a bunch of bananas.

"Don't say it, mister," she roars. "I know there's ten thousand guys ahead of me, I know you're busy, and I know there's a war on, too! Only just don't gripe about it. All I want is to borrow your hoist so I can switch my tires."



I grab a quick look at the identification badge pinned on her blouse. *Philomel Murphy, Riveter*, it says. I give her my best Page 1 smile.

"Hold everything, Miss Murphy," I tell her. "We do



get busy in here, just as busy as anyone can be; and sometimes we have to ask you to wait. But, *we're never too busy to be helpful!*"

She's still glaring at me like I was a suspected kidnaper and she was the D. A. "Are you levelin'?"

"Absolutely," I tell her. "You see, we Union Oil Minute Men wanted your business



before the war; and we certainly want it *after* the war. So we figure the way to keep your business is to treat you

the best we can—*now*. You don't need a ration coupon to get *help* around here. Now, I'll switch those tires for you!"



"Well I'll be d-darned," roars Philomel in a well-controlled bellow. Then she grins at me. "Come on, pal, I'll give you a hand anyway."

And you know what? She is not only trading with us regular, but she came in last week with an old-fashioned sampler like used to hang on grandmother's wall. She'd *made* it, sewed all

the stitches with those banana fingers of hers!

I got it hanging in the station now.

It says WELCOME!

The latchstring is always out at Union Oil Minute Man Stations. Courtesy, friendliness and essential motoring services are never rationed. We're busy, yes, as busy as anyone else, but we're...

*Never too busy
to be helpful!*

UNION
OIL
COMPANY
OF CALIFORNIA



DESERT

Close-Ups

• Margaret Stone this month writes about her Indian friends of Taos Pueblo—not the Taos of the art colony which properly is called Don Fernando de Taos, but San Gerónimo de Taos, ancient home of the Taos Indians comprising two large adobe communal houses four and five stories in height, appearing today much as they did in 1540 at the coming of the Spaniards. A third Taos is that of Rancho de Taos, the old Indian farming center. All three sections of Taos (pronounce to rhyme with house) lie near the base of the beautiful Sangre de Cristo mountains which rise abruptly to the east.

• Most rockhounds can only imagine what collecting via jeep might be like, but one of them already has been out looking for quartz crystals in one of those little war wagons. Randall Henderson, Desert's editor-on-leave, tells in his Sahara Diary this month how he followed the trail of crystal float to the source in a jagged mountain area where boulders were shot with vugs and seams of quartz. Only drawback—he discovered that a chisel is an inadequate tool. But rockhound equipment is scarce in the Sahara desert of Africa.

• Indian legends often have strange parallels with the folklore and history found in literature of other peoples. One such analogy is contained in the Pahute legend told this month by Charles Kelly in his mining story of southeastern Utah, "Arrows From the Rainbow."

• Because Charles F. Lummis played such a dominant role in acquainting America with the natural wonders, antiquities and peoples of the Southwest, anyone interested in the Southwest inevitably will be led to the life and works of this man. Hope Gilbert, whose chief enthusiasms are the archeology and the Spanish and Indian cultures of the Southwest, had the good fortune to know him personally as well as through his works. She tells in this issue some of the highlights of Lummis' life. Her work under Dr. H. E. Bolton at University of California and under Dr. Edgar L. Hewett at School of American Research in Santa Fe has inspired further research in her fields of interest. She is a resident of Pasadena, has written of her experiences among the Pueblo Indians for various publications.

CREED OF THE DESERT

By JUNE LEMERT PAXTON
Yucca Valley, California

When Look-out Quail mounts on a limb,
Adroitly does he scan.
Full well he knows that he must keep
A wary eye to guard his clan.



Volume 7

SEPTEMBER, 1944

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—Photo by G. E. Barrett

FROM THE DESERT OF ALTAR

By PETE WHITE
Santa Paula, California

With the white clouds riding high,
That is the way he came,
With the sand under foot like the floor of hell
And the sun above like a flame.

That is the way he came,
Crawling and clawing the ground,
And I wetted his cracked and bleeding lips
While my dumb sheep gathered round.

He showed me his sack of crimson gold.
"There's more—much more—like sand!" said
he,
"Though never a drop of water cold
And never a green and blessed tree."

The days shifted by. Then—"I must go back!
I have tarried too long," he cried,
And his breath came strong and his eyes flashed
bold
And his strength flowed back like the tide.

So he set on his way with the white clouds high,
A shadow engulfed by the distant haze;
But he never came out and his bones will lie
With the rocks in the sun 'til the end of days.

(This is the tale in a lonely land
By a lonely fire an old man told
As westward he raised a pointing hand
To an endless desert of death and gold.)

CUP OF GOLD

By EDYTHE HOPE GENE
Hollywood, California

When Zeus from some Olympian hall,
Was wont the rich ambrosial wine to sup,
He called the gods from near and far,
Holding high a golden chalice cup;
Then tiring, flung the thing away,
Down embered hillsides when the sun was
gone—

Today I found a shining cup
Filled with the nectar of a summer dawn.

Desert Sand

By JACK GREENHILL
Los Angeles, California

The desert sands are memories
Of waters that have died,
The silent longings of wild seas,
Renounced to grief and pride.

The desert sands are smiles and sighs
A myriad years have borne,
The stifled echoes which will rise
On resurrection morn.

The desert sands are whispers which
The waves and tides have told,
Turned into crystals by some witch
For endlessness to hold.

These sands are a forsaken breast,
On which grave waters lay,
Then left as birds will leave a nest
For winds to tear away.

PERFUMES

By MILDRED POWERS
Santa Barbara, California

A million roses wept this year in France,
The lilies grow there still, and in the spring
The stolid peasants gather them and brew
A glorious attar full of fragrant lure.

The spices and the musk of Araby,
Are honey-sweet as incense—powerful, rank,
They tempt the swirling senses with delight,
And smother with delicious vertigo,
The very soul of man who dares their snare.

But not a dew-sweet rose in all Provence,
Nor all the Orient's frankincense and myrrh,
Can yield such perfume as my heart recalls . . .

There is no heady fragrance in the world,
So heart-break sweet as summer rain on sage!

ADOBE HOUSE

By SADIE FULLER SEAGRAVE
Oakdale, Iowa

Haunted, the neighbors say, and shake their
heads.

They do not understand. They dimly see
Thin vapor rising from the chimney top,
And pale fruit hanging from a shadowy tree.
It frightens them to push the vines aside,
Their hands press lightly on the unused door.
They stare, bewildered, at the bright blue cups.
They do not dare to cross the sanded floor.
A ghostly clock, upon a crude low shelf,
Counts off the time in minutes long as hours.
Sometimes a woman's husky voice is heard:
"O, my beloved, do you note the flowers?
See how the lilies freshen in the breeze,
And lift their shining heads in wordless praise,
See how the hollyhocks shame the rising sun.
Yet never match the splendor of our days."

Haunted, the neighbors say, and shun the place.
They do not understand. They count their beads
And wonder why the clearing round the house
Is always free from withered stalks and weeds.
A ghostly burro droops his patient head,
Heedless of alien feet that swiftly pass,
A brooding silence hovers . . . but there stirs
A promise in the softly springing grass!
This house, Beloved, which our mortal years
Conceived but never knew, has substance deep,
And waits fulfillment when the west wind blows
And we awaken from this mortal sleep.
Then will the faggot on the hearth be red,
And humble knees be bent upon the floor,
The Virgin Mary from her niche will smile
Who long had wept to see the closed door.

ROCK WREN

By LAURA LOURENE LEGEAR
Long Island, New York

Her tiny heart hangs heaven-high,
Flirting with a thorny flower,
Her fragile weight a butterfly—
Drinking sunlight like a shower.

Going to an engagement party in Taos is almost as solemn an occasion as going to a wedding. But when the rosaries finally are exchanged, and the relatives gather to taste the engagement sweet and eat Indian and Mexican food, Margaret Stone found it could be as gay as any party. This is just one of the phases of family and social life she was allowed to share when she lived for a while with her friend Josefa in one of the terraced pueblos of Taos . . . To the outside world, Taos is an art center. Aside from this about all that is known of Taos is that the men wrapped in their burnous-like blankets give an Oriental touch to the scene and the comely women are picturesque as they dip water from the creek or take fragrant loaves from outdoor ovens. Although the Taos are polite to visitors in the daytime, they withdraw at night to their whitewashed rooms in the pueblos, to live much as they have lived since before the days of Coronado, 400 years ago. It is about this side of Taos life that Margaret Stone writes this month.

Where the Eagle Feathers Fell

By MARGARET STONE

"COME home with me to Taos," begged Josefa when she left Sherman Institute school in California to return to her home in Taos Indian pueblo. High among the Sangre de Cristo mountains in northern New Mexico, the two huge buildings which house the entire tribe have dominated the plateau since long before the coming of Coronado's captain, Alvarado, in 1540.

These two terraced pueblos, one of four stories and the other of five, face each other across swift running Taos creek which divides the village. Across the creek are thrown rough hewed logs and here the young men gather in summer evenings to serenade their sweethearts. The scene is little changed since the coming of the Spaniards.

Then, as now, the men draped themselves in white blankets of their own weaving and the women baked their food in outdoor 'dobe ovens and did most of their homemaking on the rooftops of their sleeping rooms. Taos was Taos in 1680 when it gave refuge and aid to Popé during his rebellion against the Spanish soldiers and priests. Taos was Taos under the flag of Mexico. The Mountain Men of Kit Carson's Fur Brigade were welcomed in its plazas. The death cries of the murdered family of Governor Bent rang through its alleys, and the terrible war-cry of Navajo, Comanche and Apache have sounded in many of the thickwalled rooms. Still Taos is Taos, unchanged and unmoved by the ages.

The years swept by and I still had not accepted the invitation of my Josefa. I was her "adviser" at school when she and 200 other Indian girls from a dozen tribes made life interesting. I still like to remember that my chief advice to those girls was, "Take whatever is of use to you from what the white race offers. Take only what will help you in your own way of life. Remember, and always be proud of the fact that you are Indians!" I kept in touch with Josefa during the years and I knew she had married Ramón, one of the boys who had been to school with her. I also knew that her two fine boys had been chosen to represent the Taos Indians on a ceremonial tour of Old Mexico. I wanted to know more of this tour, and the time had come to visit Josefa of Taos.

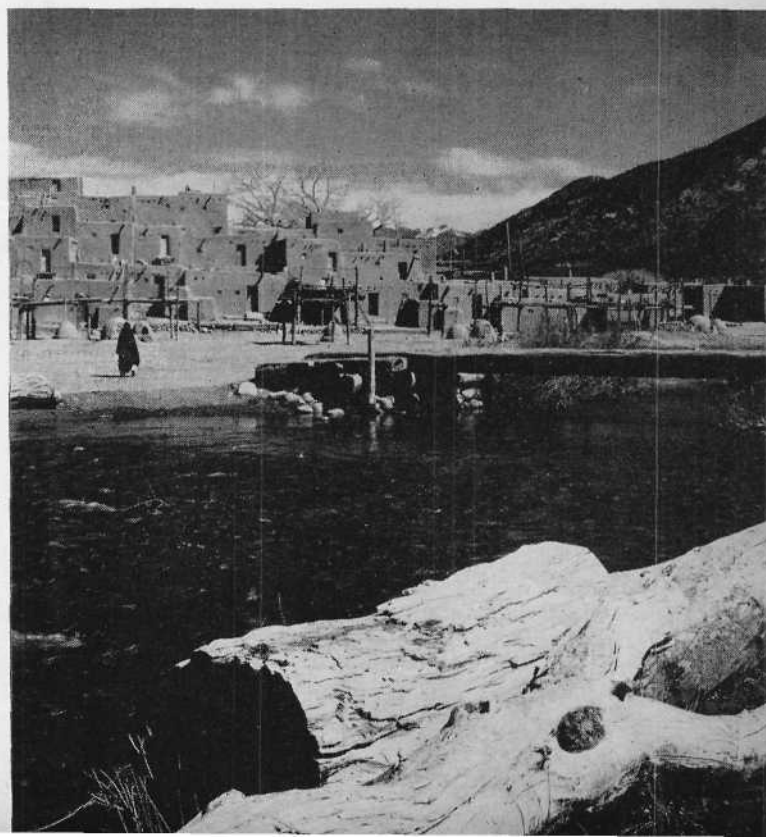
Josefa was in the dusty plaza of the old pueblo as the stage reached it. She still was beautiful. The slim youthful charm had mellowed into the calm, serene beauty of a happy contented wife and mother, but a bit of mischief lingered in her eyes. She was

well aware that a world famous artist was making a swift sketch of her as we stood chatting after our first joyous meeting. I couldn't blame him at all. She was all curves and smiles and a symphony of soft subdued colors. Her blouse was white with colored embroidery, the skirt was full and short and a faded blue. From its edge the lace ruffles of her petticoat showed as should the petticoats of all fashionable Taos matrons. Her small feet seemed smaller still in their white doeskin moccasins over which lapped the roll leggings of the same material. Over her head and shoulders was loosely draped a shawl of blue and gold and crimson.

"You are too thin, my Margo," she said, using the name of our other years. "You stay with Ramón and me and we'll fatten you up!"

"I wish I could stay forever," I answered, and meant it. The huge terraced houses were peaceful and drowsy in the afternoon sun. Behind them the snow capped mountain rose majestically from its foundation of blue green forests. Sleepy donkeys passed through the plaza, their towering loads of fragrant firewood destined for the hearths of writers and artists in the colony close by. I brought my wandering eyes back to Josefa. "I have only a few days to spend, and I want to learn all you can teach me about the real living of your people. I want to go behind the painted

San Gerónimo de Taos, or more commonly Taos Pueblo, is comprised of two facing terraced adobe buildings separated by Taos creek, seen in foreground. The creek flows through a central plaza, is crossed by great pine logs. On moonlight nights this is a rendezvous where young men serenade dark-eyed maidens. New Mexico state tourist bureau photo.





Beauty and precision characterize the dances of Taos Indians. Young men, painted in the sacred colors of Taos, keep step with the thump of the tom-tom as they slip through brightly painted hoops from which the dance takes its name. Photo by Harold Kellogg, Santa Fe.

scene presented to sight seers. Most of all I want to know all about this tour to Old Mexico your boys are making."

Josefa laughed. "You haven't changed at all. You still want to know too much!"

I dropped into the daily routine of Josefa's home. For my own use she gave me a spotless little whitewashed room with its raised ledge on which my blankets were spread at night. I ate the delicious food she cooked for her family. Ramón was tall and quiet, saying little but always following his adored talkative wife and handsome sons with proud happy eyes. Such boys! Luis Malone, with his mixture of Irish and Spanish names, was the older. He had enough eager young enthusiasms for half a dozen boys. All his heart and soul just at the moment were engaged in making ready for the Mexican tour.

"Tell me all about it, Luis, from the very beginning."

"Well, last year four boys from a college in Mexico came to our school (Albuquerque Indian school) and showed us how they dance in their country. They played their guitars and sang and told us stories of the Indians in their land, and of their own people. We liked them, and we made a plan to go into Mexico and take our songs and dances and ceremonials to them. Our teachers helped us plan it, and we gained permission from Washington to go, but there was no money, Washington said. So we earned our own money! About 75 of us are going and we have money enough to pay our way, even to pay for wear and tear on the cars which will take us. While we are there we will be guests of the Mexican government, but we will camp near the villages and cities and cook our own food. O, it's going to be great!"

"How did you earn the money?"

"How? How *didn't* we?" He was so excited he walked back and forth across the big kitchen as he talked. "The boys washed windows and mowed yards and cut firewood and delivered it to homes. We washed and polished cars and some of us worked in stores. We did just anything to earn the money. The girls took

care of white babies and they sold embroidery and water color sketches they made. Lots of our fathers and mothers helped by giving us baskets and blankets we could sell."

Juan Pablo, the younger son, was the dreamer, the artist of the family. The walls were covered with his clever sketches of village life. A collector would pay much for the picture he had made of a young mother and her baby. The child was trying its first steps alone and a frolicsome kid was interfering. There was everything in that small picture—humor, fear, confidence and most of all, love. Juan Pablo always saw the first pink light of dawn on the mountain tops and called the white woman to share the beauty. Someway I knew Josefa loved him best "We regret to inform you that your son, Juan Pablo Abeyto, is missing in action at Bataan. It is presumed he is held prisoner by the Japanese."

No shadow of war's blight fell on us as we three women, Josefa, Juanita, Juan Pablo's dainty sweetheart, and I perched on a cliff above the grassy cove where the lads were having their final training in the Hoop Dance. Not quite smooth enough were their movements; not quite sure of themselves, thought Ramón. Thus the older men of the pueblo sat in judgment each day while the boys went through their paces.

The boys were stripped to moccasins and trunks. They were carefully painted in the sacred colors of Taos, and the feather headdresses arranged just as they would be during the real dances. To us, above them, the thump of the tom-tom timing the steps sounded like a muted heartbeat. And like clockwork the young boys, slender and supple slipped through the brightly painted hoops from which the dance takes its name. First one hoop was used, then two and three, and at last Ramón tossed a fourth hoop into the ring. Without missing a step in the dance the boys stepped into the hoops, brought them up over their bodies, thrust their befeathered heads through them and brought them back down over their bodies again. The old men grunted with approval.

An eagle wheeled and drifted overhead and as Josefa watched it with dreamy eyes, she told me this story of the founding of Taos.

"Far away in the north once lay a beautiful lake. From its waters rose the Taos Indians. They wandered south, far south—those lake children—until a great sickness came driving them back to the north. With them they drove big flocks of turkeys they had captured in the southern mountains and tamed. When they were very weary they stopped and built a place to live, but they were not happy there. A young chief grew up and told them they must move still farther north and they followed him.

"As they moved away from their temporary home a great eagle with the sun gleaming on its wings swept down out of the blue and kept circling ahead of them. It led them on and on until they were weary to death. Then at the foot of the big mountain there, which you know is a sacred mountain, two feathers fell from the eagle's wings, one on each side of the swift little river. There the young chief stopped. 'This is where we will build our homes for the generations to come, one big house where each feather fell.' The eagle had been hovering above but when the words rose up to him he circled once more and rose up and up until he was lost in the blue."

Tribal life has changed little during the centuries. The Taos people gravely greet white visitors when they arrive; they pose for pictures, allow white visitors to come into the front rooms of their homes and they sell them curios obtained from other tribes since the Taos have no distinctive arts and crafts; allow them to take pictures of the *tapestes*, platforms on which they pile their fodder and alfalfa hay out of reach of the goats. For a consideration a smiling matron in Indian dress will stoop at the open door of the *borna*, outdoor oven where she bakes her bread. Throughout the day the Taos people will mingle with the white people so eager to part with their money, but at night they go into their homes and steep themselves in piñon smoke and Indian ways.

"Would you like to go to Lolita's engagement party?" Josefa asked me one morning. She knew wild horses couldn't drag me away if there was any chance of being invited! She teased me awhile and then said Lolita had asked her to bring me to the party. While Josefa bustled about in her spotless kitchen preparing the engagement sweet she gave me pointers on Taos courtships, engagements and marriages. This particular pastry she was making is served only at engagement feasts and is made from nature's storehouse. Wild honey is thickened with flour made from roasted piñon nuts or sweet acorns, and into the mixture is beaten wild turkey eggs found in the nests of the big birds far up in the mountains. The mixture is shaped into flat cakes and baked or dried in the oven and then rolled in chopped sunflower seeds.

The Taos people do not enter lightly into marriage. Lolita and her lover had been to school together and when they returned to Taos they asked their parents to allow them to marry. The four parents, with a great-uncle of the girl held a meeting and approved of the step. The engagement party is given at the home of the girl and is attended only by relatives of the couple. The girl's people are all there, seated on the floor at the right of the door when the boy's folks arrive in a body. They seat themselves at the left of the door facing the other visitors. The boy enters at the front door and the girl from an inner door and they are seated between the two factions. Then the great uncle takes up the questioning. "Are you sure you want to marry with each other? Will you work and save your money and stay only with each other? Will you take care of each other in sickness? Is there anybody else either of you would rather marry?"

When he has exhausted his examination, he invites anyone present knowing of any reason why the young folks should not marry to say so then and there, or else forget about it.

Nobody advanced any reason why Lolita and Tomás should not wed and the uncle asked her, "Lolita, do you wish this marriage?" Lolita giggled and nodded her head. "Tomás, do you wish this marriage to be?" Tomás looked straight at the old man and said quite earnestly, "I do wish this marriage with Lolita to be!" Rosaries were exchanged by the young couple and they were formally engaged according to the best Taos traditions.

We vacated the big shadowy front room and went into the even larger and more shadowed kitchen, lighted only by a few flickering candles. There we feasted on all sorts of Indian and Mexican food. The engaged couple sat far apart and as far as I could tell never looked toward one another nor spoke during the evening. When each guest had tasted the engagement sweet we trooped back into the front room to view the presents. In the meantime the chest of gifts prepared by Tomás for his future wife had been brought from the home of his parents and it stood in the center of the room. It was opened first, and on top of the contents was the traditional white buckskin leggings and moccasins which each bride receives from her husband. He is obligated to kill a deer, skin it, tan the hide himself and either make the footwear or pay to have it made before he can accept his sweetheart's rosary at the party.

In my eagerness to see what was in the chest I was on tip-toe. One of the tall men wrapped in his white blanket pulled me around in front of him where I would miss nothing. I learned later that he was the boy's father. The boy's mother lifted each gift from the chest and it was passed gravely around from hand to hand, then returned to be replaced. There were bright strings of beads and cakes of colored soap, bolts of lace and embroidery for the blouses and petticoats of the girl, a rose and yellow shawl, silk stockings and writing paper.

Each visitor presented the gift brought for the bride and they were all duly examined and appreciated. In searching for some-

thing I could take I had found a bottle of perfume, "Evening in Paris," and it played its small part in an "Evening in Taos." It was amusing to see the stolid men sniffing at the fancy blue bottle with its silver stars. One weather-beaten old citizen tipped his head back time and again and with closed eyes inhaled the odor. "It smells like the love songs of my youth," was his final verdict, and no one laughed at him.

There would be a marriage in the church two weeks from that time and then the young couple would live with her people until they could build some rooms of their own, possibly atop the five-story pueblo in which we lived. The old men chosen to rule the pueblo would keep an anxious eye on the marriage and see that neither Lolita nor Tomás went to dances without the other, and that he did not ill treat her, nor she neglect her home in any way.

"I don't think they will pay much attention to the old men and their instructions," I sniffed. "O, don't you?" Josefa and Ramón both were laughing. "Well, *we* started out to be very independent. We moved into a big windowless room on the ground floor where my grandmother had lived. The first thing we did was to tear out some of the ancient plaster and set in a big glass window with a nice Mexican blue frame. I even had flowers inside that window!" She went into a dream of the past.

"Well?" I prompted. "It wasn't well," said Ramón. "The old men came and looked at it and said, 'Remove the window and build back the wall.'"

And Josefa had obeyed. She gathered a great pile of thyme and sedge grass and piled it on a bare spot. This was lighted and allowed to burn into coarse ashes. While the ashes still glowed, wet dirt and cut up straw and small pebbles were tossed on it and the whole mixture stirred into a stiff mass. Then Josefa took handfuls of it and shaped them into rough bricks with which she filled in the old wall as it had been. There was no appeal from the verdict of the Supreme Court of Ancients in Taos!

Windows have made their appearance now and fewer ladders are to be seen, but as late as 1740 the pueblo was guarded by means of pulling up the ladders when Comanche and Apache or Navajo approached, and only a few years ago was the Watcher of the Night abolished. I have seen the ghostly form of the sentinel, wrapped in his blanket, stalking across the rooftops, halting now and then to investigate a noise or shadow. There always



Josefa's youthful charm had mellowed into the calm serene beauty of a happy wife and mother but mischief lingered in her eyes.



The typical white doeskin leggings over white moccasins make the Taos matron's small feet appear even smaller. A Taos maiden receives her first moccasins and leggings at the traditional formal engagement party. Her fiancé is obliged to kill a deer, skin it, tan the hide and either make the footwear or have it made before he can accept his future bride's rosary, confirming the engagement. Photo by Frashers.

was something lonely and awesome in his hourly call assuring the people under his care that they were safe.

On the last night I spent with Josefa and Ramón they brought some of the old men into their home to tell me of the ancient ways of their people.

The governor of the village told me of the treasured chest now in his care, handed from governor to governor. It contains the writings of one of the first Spanish soldiers who came to Taos. When he left he gave his record to an Indian and asked that it be kept safely until his return. Centuries have come and gone and the soldier failed to return but the Indians are keeping the faith. The chest never is opened in the presence of white people.

The Taos religion is a mixture of Catholic belief and their own native rites. In the room that night was the young priest in charge of Indian ceremonies. He explained some of their own rites to me. I was most interested in their prayer season which in a way corresponds to Lent.

Life of a Taos family is little known and little affected by white men. U. S. Indian service photo.

"About December 5 or 6 we pray," he said. "The season is sacred to the sun and we pray for an early summer and for good crops." Since the Taos Indians depend upon their fields of grain for their living no wonder they cater to the sun.

"During that time we do not hitch horses to the wagons. Our women bake bread without yeast in it, and they do all their sewing by hand, not on white man's machines. No good Taos has his hair cut then, and we do not stay with the women during the praying days. No meal is ground by the unmarried girls and the boys may practice their dances but they must not put any paint on their body or faces. After awhile, about a month, different ones of us go and sit in Glorieta canyon and pray again for summer to come and for the wheat fields to be heavy with grain. The medicine man stands in the center praying for food for all. When he is finished praying the horses are hitched to the wagons and we work hard in the fields.

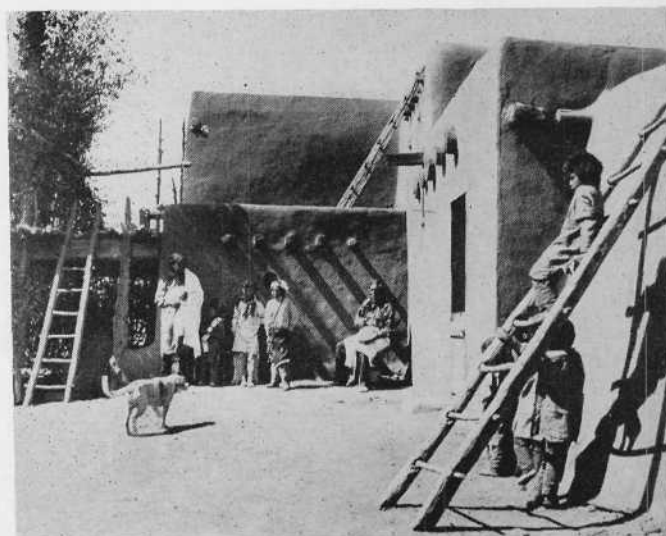
The Taos people are deeply attached to their children and the group of old men teach the small boys how to dance from the time they can walk. On each November 2nd, All Souls' Day, all the people gather at the graves of their loved ones and leave food for the dead. At twilight, parents of babies who have died during the year, quietly leave the others and go up into the canyons where they leave bottles of milk and bits of cake and candy for their dead children.

All these things they keep to themselves, and about all the white visitors know is that the men wrapped in their burnous-like blankets give an Oriental touch to the scene, and that the comely smiling women are picturesque as they dip water from the creek or take the sweet smelling loaves from their outdoor ovens.

Leaving the peaceful pueblo early in the morning I drove down by the clear river and saw Lolita dipping water for her washing.

"What would you like best for your new home?" I asked. She came close to the car and with almost painful intensity said, "Do you think maybe you could send me a canary, a yellow canary to sing in a white and green cage?" I thought maybe I could, and the last time I heard from Lolita the canary joins in when she sings to small Juan Pablo safely wrapped in his cradle hung from the rafters. When Tomás heard that his friend Juan Pablo the dancer was held by the Japs, his small son was only a few hours old.

"We will call him by the name of our friend," he said, and he went into Santa Fe and enlisted. Lolita and Josefa wait for news in the old pueblo where for hundreds of years other women have waited, but Juanita welds wings for airplanes that may help rescue her beloved Juan Pablo.





Mt. Pennell, one of the five peaks of the Henry mountains, showing (left) Farmer's Knoll where Neilus Ekker and his sons are mining petrified logs containing vanadium.

Arrows From the Rainbow

The Pahutes have a legend that the petrified trees found buried in the ground and embedded in the cliffs of their ancestral home in southeastern Utah are the spent arrows of their god Shinob. In those mythical days, three great monsters were ravaging the earth. To protect the Pahute people, Shinob shot lightning-tipped trees from the rainbow to bring peace to the world. Now those same arrows are helping to destroy the monsters who are pillaging the earth today. Neilus Ekker and his tall sons are digging the arrows of Shinob from the earth where they plunged when the world was young. They contain, not lightning, but vanadium and uranium, which help speed the arrow-planes against the enemy giants of today.

By CHARLES KELLY

LONG ago when the world was young, according to Pahute legend three great monsters roamed the earth, destroying corn crops, driving off game, killing defenseless people and generally making life miserable for the Indians. Having but recently emerged from the underworld the Pahutes were weak and unskilled in the arts of war, unable to defend themselves against these three great forces of evil. At last Shinob, the great Pahute god, took pity on his helpless people

and personally came to their defense. Seizing a rainbow out of the sky he fashioned a mighty bow, and for arrows used the trunks of full grown trees tipped with lightning. Thus armed, Shinob fought and finally destroyed the monsters, bringing peace to the world.

In this epic battle, the Pahutes say, some of Shinob's arrows struck the sandstone cliffs and penetrated solid rock, leaving only their butts exposed. In certain sections of Utah they will show you these arrows

still imbedded in the cliffs. Many years ago they pointed out some of those mighty arrows to Major John Wesley Powell, who did the first geological work in southern Utah and explained how they came to be imbedded in the rock. Powell named the conglomerate formation in which he saw them Shinarump, a combination of the Pahute words *shinob*, god, and *arump*, arrow. It still is known to geologists by that poetic name.

Now, strangely enough, those petrified logs, believed by the Indians to be the spent arrows of their god Shinob, once more are doing their part to destroy the three great monsters of this latest and greatest conflict. In the Henry mountains of southeastern Utah men are busily at work digging out those legendary arrows and converting them to the uses of war. For these petrified trees contain vanadium and uranium, two strategic minerals highly important in speeding our modern war chariots against the forces of evil.

The five great peaks of the Henry mountains, some of them rising to a height of more than 12,000 feet, are surrounded by



The Ekkers loading a truck with vanadium ore to be hauled 112 miles to the nearest railroad shipping point.

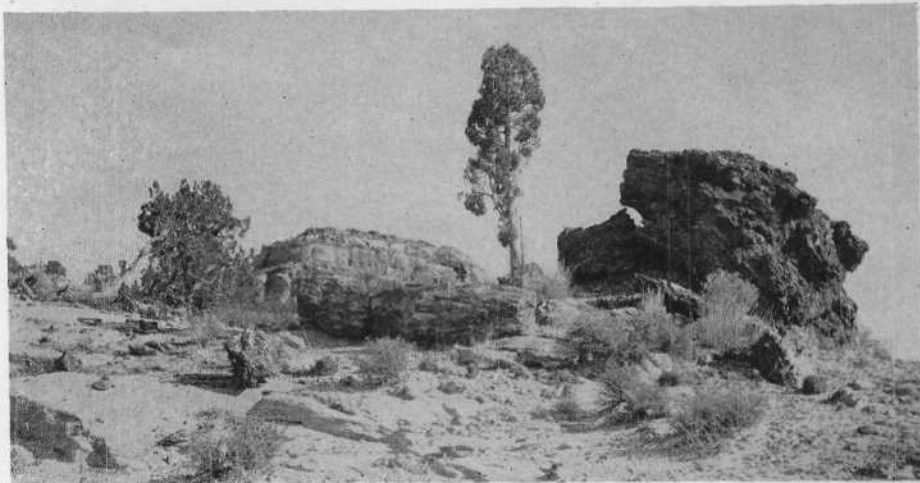
hundreds of square miles of wild, broken, waterless desert in southeastern Utah. It is not surprising that being situated in one of the wildest and least known sections of the United States that they should have been among the last ranges to be discovered. On Major Powell's first map in 1869 he noted them as the Unknown mountains. Even today the men who really know them can be counted on the fingers of one hand.

Geological formation of these peaks is widely known as laccolithic, a type of intrusive igneous occurrence which was named and described in these same Henry mountains many years ago. But recent studies have shown that the igneous bodies here are not laccoliths but stocks, which have intruded in quite a different way.

Geologists describe a stock as a dome-like body of igneous rock which has been formed by the rising from the earth's interior of magma so viscous it could not spread out in a sheet but solidified in a dome shape. As it rose it broke through sedimentary strata, and in doing so it warped and folded them. These strata often are partially eroded from the top, exposing the igneous intrusives, but remnants of the folded and tilted sedimentary rocks are left around the sides of the core. Not all such examples show this erosion. Navajo mountain in northern Arizona, for example, is deeply scored by streams, yet does not have any of its igneous rock exposed.

The Henrys, though, have the broken edges of sedimentary strata lying exposed and weathered at their bases. On one such formation, near the eastern base of Middle mountain, stands a prominent butte known as Farmer's Knoll. In the base of this butte is a layer of sandstone 50 feet thick containing thousands of petrified tree trunks, some of which protrude from the solid rock.

Many years ago prospectors searching for gold in the Henrys, discovered that some of this petrified wood contained a bright yellow stain. Analysis proved it to be radio-active uranium ore. A quantity



Petrified log and huge stump eroded out of the base of Farmer's Knoll. Most of such petrified wood contains uranium and vanadium.



Pahutes believed these petrified tree trunks, eroded out of the cliffs, were arrows of their god Shinob.

Ekker brothers uncovering a petrified log rich in vanadium.



was shipped to Madame Curie, who used it in her early experiments with radium.

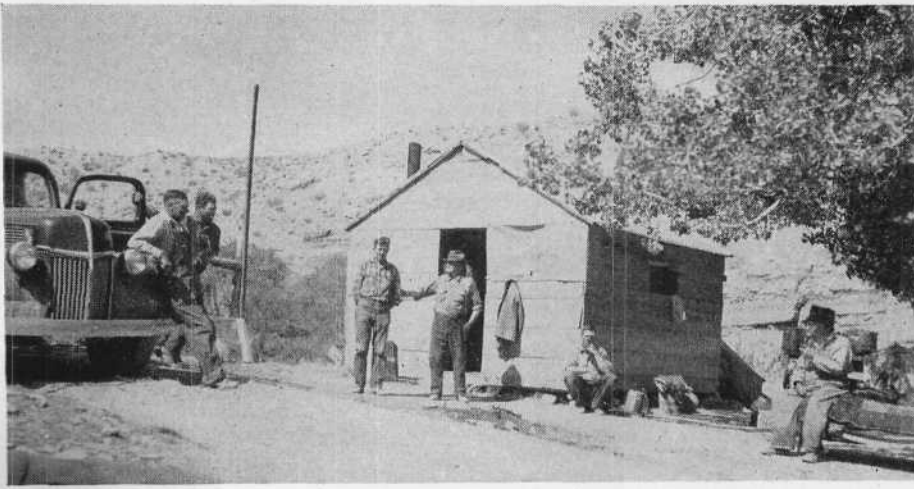
In removing the petrified tree trunks it was found that those containing uranium were enclosed in a hard case of heavy black material several inches thick. This casing proved to be rich in vanadium. The uranium salts, being more soluble, had been concentrated in the petrified wood. Then some of the gold seekers returned to mine the petrified logs for their uranium content. As they blasted small tunnels out of the rock the base of the knoll became pock-marked.

But foreign deposits, more easily mined, kept the price low, and when it dropped even from that level the workings were abandoned. In this present war, however, with most foreign sources cut off, vanadium has become an important strategic metal. One old miner, remembering the vanadium ore found encasing uranium-bearing logs, returned to open the old workings.

He was Neilus Ekker, who with four of his sons, all young giants, now is busily removing the "arrows of Shinob" from Farmer's Knoll to recover the black vanadium ore with which they are surrounded. His camp is located on Trachyte creek, one of the few streams of good water found in the Henrys, 112 miles from the nearest railroad.

On a recent visit to this isolated camp with Dr. A. L. Inglesby, Mr. Ekker demonstrated for us the technique of mining petrified trees. The sandstone in which they are imbedded, he explained, contains uranium and vanadium in small quantities. During countless centuries the minerals have been slowly leached out of the rock and deposited in and around the fossil tree trunks. A peculiarity of this process is that while one tree may be rich in mineral, others lying beside it often are completely barren.

Neilus Ekker, who has become expert in detecting and appraising vanadium ore, spends most of his time prospecting along



Neilus Ekker, left, at his camp on Trachyte creek in Henry mountains, Utah.

the base of the butte for evidence of mineral. When he finds a likely spot his sons begin blasting out the ancient logs, carefully removing the outer covering of black rock. Neilus Ekker, with a practiced eye, then sorts the ore, keeping only the richest for shipment over the long, rough desert road to Thompsons, Utah.

Ore shipped by the Ekkers averages only four per cent vanadium, which is considered high grade for this rare metal. Occasionally a log is found which may run as high as 17 per cent, but this is rare. Other vanadium ores are being mined in various parts of the country, particularly in Colorado, but most of it is low grade, averaging around one and a half to two per cent. That shipped by the Ekkers from the Henry mountains is mixed with low grade from other districts to "sweeten" it and make milling more efficient.

Refined vanadium is now worth 45 cents a pound and the Ekkers are paid on this basis. Their raw ore brings around five



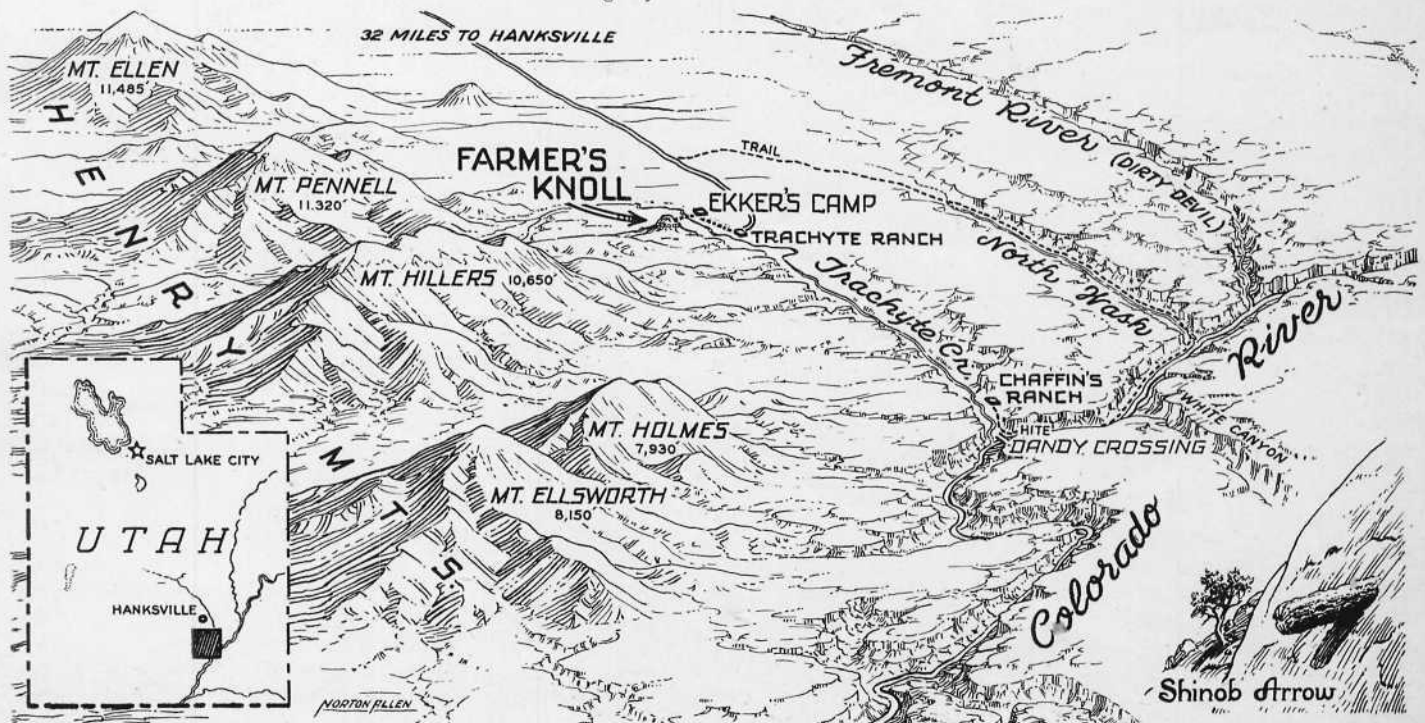
Fragments of petrified wood from Farmer's Knoll, impregnated with bright yellow uranium ore.

cents a pound, while an occasional shipment may be worth as high as ten cents. They consider themselves lucky if they recover a ton of ore a day, which is accumulated in a stock pile and hauled by truck in five or six-ton lots. Some of it may go to Durango, Colorado, but the richest is shipped to Pittsburgh, where it is refined and used to toughen steel for axles, propeller shafts and other parts subjected to great strain. Without this important alloy our military vehicles and planes would be greatly slowed down.

The uranium content of these petrified trees is low, averaging about two per cent, but occasionally a quantity of bright yellow powder may be found in the heart of a log which will go 50 per cent. This extremely high grade is saved and shipped to one of the few plants equipped to refine it, where it is made into luminous paint for watch dials and instrument panels. The yellow powder is so strongly radio-active that photographic film left in its vicinity for a short time is fogged and ruined.

Mineral bearing logs are found either in the loose rock and dirt around the base of Farmer's Knoll or in the solid rock of the knoll itself. To remove them requires an enormous amount of hand labor, and since deposition of the ore is limited to the immediate vicinity of individual logs, profits of such mining operations are not great. But recovery of vanadium for the machines of war is a vital necessity and Neilus Ekker's sons are helping the war effort as much as if they were on the front lines of battle with some of their brothers.

As though to prove the validity of the Pahute legend, these ancient "arrows of Shinob" once more are being used to help destroy the three great monsters of the modern world.



LETTERS . . .

Photos Unfold Insect Life . . .

Long Beach, California

Gentlemen:

I cannot begin to tell you how much I enjoyed the photographs and article "Intimations of an Unseen World" by Richard L. Cassell, in the July issue of your invaluable magazine.

In Death Valley a few years ago I was utterly fascinated by the "delicate tread of insect life" as Mr. Cassell so aptly puts it. I have followed the designs along the edge of a dune to its very end to find what type of insect was responsible for them. Not until I saw the pictures in your magazine was the mystery unfolded to me.

The assortment of back numbers I recently received from you is proving a source of much pleasure as each number contains information which I have long been seeking. I feel I have missed a great deal by not having in my possession each issue since the magazine's inception.

NINA CONLEY

Seeks Brigham Young Kin . . .

Hamilton, Kansas

Dear Editor:

I wonder if through your magazine I might locate relatives of my late husband, F. R. Cookson, who was a nephew of one of Brigham Young's wives. My husband's parents came to America from England on their wedding trip when his mother was 16. Father Cookson often has told me how his brother John and his sister (either Elizabeth or Caroline) came here when they were very young. He never heard from his sister; John died a bachelor. It is said that Brigham Young's wife, who was my husband's aunt, was a fair and beautiful English woman. If any of her descendants are living today, I should be pleased to get in touch with them. As I grow older and have visited some in Utah, I marvel at the greatness of these people.

BERTIE COOKSON

Wants Northwest Articles Too . . .

Great Falls, Montana

Gentlemen:

My family and I like Desert Magazine, particularly geology, mining, gems and minerals, amateur gem cutter departments. The quality of the photos is splendid. The entire magazine is usually interesting and attractive.

As we have no comparable publication for our northwestern states, we folks up here in the northern Rocky Mountain regions would appreciate an occasional article of more local interest. As many of your southern readers have lived or visited here, I do not believe they would object.

GEO. W. TINTINGER

"Let the Jeep Be" Campaign . . .

San Diego, California

Desert Magazine:

Mr. Whiteside, put 'er there. I agree 105% with you on your "let the jeep be" campaign, started in the May issue. After the war I expect to go into the field of commercial prospecting and I don't want to use some old ladies' version of the fine vehicle known as a jeep for desert and mountain work. Let the government sell them as is.

And to the editor—your magazine is the finest in its line, bar none. Being a pessimist at heart, I searched this May copy of DM from cover to cover for something to gripe about, but could find nothing. It is A-1. Keep it up.

EARL L. LANGGUTH

. . .

Devises Desert Reading System . . .

Yorba Linda, California

Dear Friends:

And I really mean "friends." I would not be without your Desert Magazine for anything. I have a very special method of reading your magazine which provides me continuous pleasure. I never read the magazine entirely through at one sitting. I usually read two or three articles, a few ads, etc., then I lay it away for future reference. Then if time is plentiful, I pick up another Desert magazine and read the articles which were left unread before. In this way my magazines are always new to me.

If you could peek into my storage closet you would find a huge stack of interesting packages which would prove familiar to you. For they are Desert magazines dating back to the very first number. I treasure them highly and they are a source of great reading pleasure and education. I enjoy the advertisements too, and read them all. In fact, I never thought it very fair for folks to absorb the splendid articles and information and overlook the advertisers who help to keep it going.

Like most of your readers, I am glad the Souths have found that there is no place like home, even if it is on top of a desert mountain peak. I had a good set of "fidgets" all the time they were gone and it was with great relief that I found them once again on Ghost Mountain. When they left to roam around over several states, I felt uprooted because everything I had ever read about them centered around Yaquitepec. Now all is well.

I like Randall Henderson's page and am looking forward to the time when we will have first hand information about the deserts of other lands.

MRS. ETHEL YORK

Heat Effect on Rattlers . . .

Delta, Utah

Dear Editor:

May I add my observations of the effect of extreme and unobstructed heat on rattlesnakes?

I had a rattler on display in my newspaper office in a shallow wooden box with a plate glass cover, with tiny openings for air. I wanted a photo of it so I set up the camera out in the direct sun, adjusted the focus on the spot below where I was to set the snake box. Then I went in to bring out the snake. During the slight time I used to get accurate focus, the snake died in the tray, and through the ground glass I saw it writhe, push hard to get out—then turn partly belly-up and die—all in less than one minute.

Next season I had two rattlers in a somewhat deeper box, about eight inches deep, with plenty of ventilation and the same polished plate glass top. Having to leave on a trip I felt I could not chance an accident in my absence to my children so I determined to kill them. I took the box out back of the office, propped it so that the sun shone directly in, took out my watch and timed proceedings. In slightly over one minute one snake was dead, and before the end of the second minute the other also had succumbed.

We have plenty of rattlers in this territory and I have never yet seen one voluntarily in direct sun on a summer day. In capturing them, one can wear them down faster if he constantly herds them into the sunlight. Snakes have no porous skin, hence they actually cook.

FRANK BECKWITH

. . .

DM for Desert Nostalgia . . .

San Diego, California

Gentlemen:

I am a press agent with a dual personality. One half of me dresses up and goes to town and pounds typewriters and makes ads for a local theater. The other half likes to don faded, worn outing togs, go down to the desert and roam its vast and uneven terrain in glorious solitude. Since the war, the latter half has been all but frustrated. Desert Magazine is its only sustenance, a monthly feeding to abate that nostalgic longing.

I was surprised to find your July cover was a scene in Death Valley. At first glance it looked like the Split Mountain country. Your human interest articles are especially enjoyable. The photos by Dick and Catherine Freeman in June issue of the Joshua tree blossoms were really remarkable. I love to con the trading post and gems and minerals—in fact, like most of your readers, I read the magazine from cover to cover. And the nicest thing of all is the friendly genuine spirit which draws us all into a community of interest.

MARIAN GRONAW

For 40 years Charles Fletcher Lummis interpreted the Southwest to the rest of America. He described the land and the native peoples in a style so vibrant and readable that his books and the magazines he edited have been important factors in acquainting the public with this corner of the country. In his many-ruled life as editor, author, collector, translator and crusader, he won both ardent friends and bitter foes—but he remained uncompromising in his personal philosophy and his sympathies with the Indians and Spanish-Americans. No one author could compile the complete biography of Lummis, but Hope Gilbert here gives a few highlights from the life of a remarkable man.

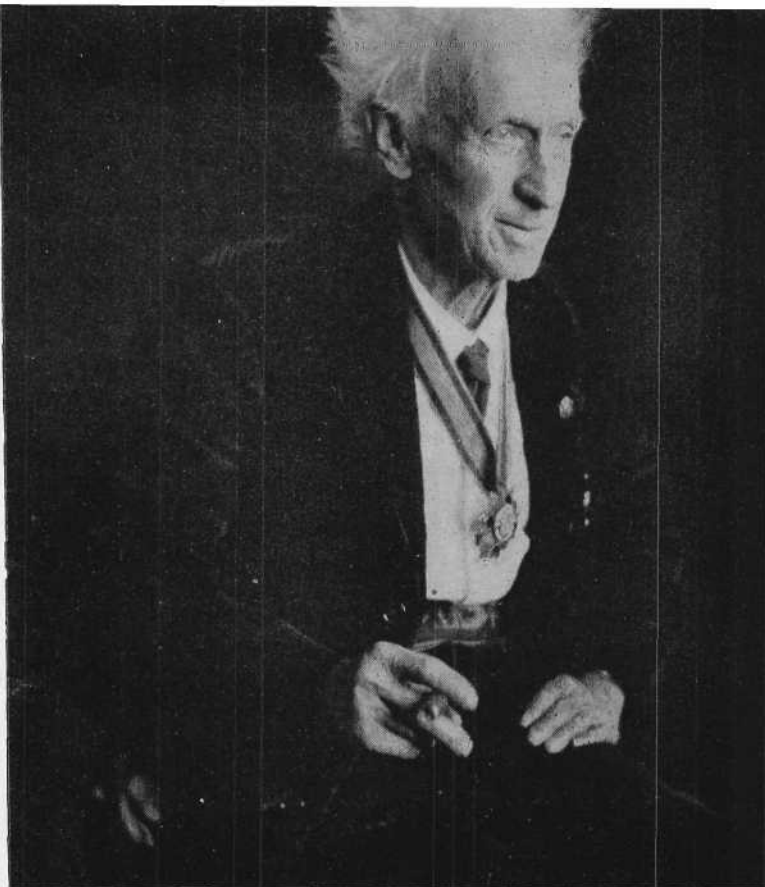
He Discovered the Southwest for Americans

By HOPE GILBERT

THROUGH the entrance of the Palace of the Governors strode a picturesque little man clad in a brown corduroy suit, a woven Indian sash girded about his waist, a large striped sack slung over his shoulder, and knotted round his head a red bandanna which accentuated his intense blue eyes and ruddy skin. As he crossed the threshold an ancient Indian rose from the corner where he had been sitting and with a bewildered expression of unbelief padded toward the newcomer on moccasined feet. As the two little white-haired men came face to face there was an exclamation of "¡Ay! Amigo!" and they opened their arms and embraced with emotion. In the eyes of each there were tears eloquent of the mutual affection of old comrades.

This meeting of Charles Fletcher Lummis and his Indian friend Santiago Naranjo, which I witnessed in Santa Fe, is one I shall never forget. It was 13 years since Lummis, ill and for a time totally blind, had visited his beloved New Mexico. It was during the succeeding months of that summer of 1926, and particularly during a 1200-mile archeological tour conducted under the auspices of the School of American Research, that I came to know and appreciate the scintillating Dr. Lummis, or Carlos, as his friends affectionately called him. I had heard of the unconventional young editor who had taken the West by storm in the 1880's and who had established in his home, El Alisal, the closest approach to a literary salon that Los Angeles ever had. Now I welcomed the opportunity to become acquainted with him at first hand.

Throughout his 40 years as author, editor, collector, translator, crusader, he won ardent friends and bitter foes. He hated sham and was fearless in upholding what he considered right. Originator of the slogan "See America First," he more than any other man was responsible for popularizing the Southwest. Hornets' nests of controversy he may have stirred up, but Charles



Charles Fletcher Lummis, wearing decoration of Royal Order of Isabel la Católica, presented to him by the King of Spain. Photo courtesy Southwest Museum.

Fletcher Lummis has left an enduring mark upon southwestern United States.

Founder and editor from 1894 to 1909 of *Land of Sunshine*, later called *Out West* magazine, he brought before a wide public translations of important Spanish documents relating to the Southwest and popularized the writings of such contributors as David Starr Jordan, Joaquin Miller, Edwin Markham, George Parker Winship, Frederick W. Hodge, Elizabeth and Joseph Grinnell and Sharlot Hall. Through the medium of his magazine he raised funds for the Landmarks club which he had founded for the purpose of saving from ruin many landmarks, including the California missions of San Fernando, Pala and San Juan Capistrano. The Sequoia league, incorporated by him, bettered the condition of many California Indians, particularly aiding the evicted Warner's Ranch Indians to secure a new and more desirable reservation. The Southwest Museum in Los Angeles is the outgrowth of the unremitting labors of Lummis and his co-workers of the Southwest Society of the Archaeological Institute of America, organized by him.

Writing in a colorfully vigorous, journalistic style, Charles Lummis' books had as great an influence as his *Land of Sunshine* in humanizing the history and wonders of the Southwest. Among his better known volumes are: "The Spanish Pioneers," "Mesa, Cañon and Pueblo," "The Land of Poco Tiempo," "A Bronco Pegasus," and "Flowers of Our Lost Romance." In 1915, in recognition of his researches in Spanish-American history and of his services in dispelling the black legend of Spanish inhumanity, the King of Spain conferred upon him the dignity of a Knight Commander of the Royal Order of Isabel la Católica.

Although my acquaintance with Dr. Lummis, extending over two summers in New Mexico, was limited, his was a personality which made a vivid and lasting impression.

It was on a brilliantly clear August morning that five cars



Lummis with long-time friend Colonel Theodore Roosevelt on steps of Occidental College during his visit to Los Angeles, March, 1911. Southwest Museum photo.

containing our party of 24 persons including Dr. Lummis, under the direction of Dr. Edgar L. Hewett of the School of American Research, assembled before the Palace of the Governors fronting the central plaza in Santa Fe. We were about to start out on an archeological tour that was to prove one of the memorable events of my life—memorable not only in the significant archeological sites visited, but also in the happy associations with an unusual group of writers, scholars and artists. When asked how I, but a year out of college, managed to “horn in” on such a distinguished company, I could only shake my head in wonder at my good fortune.

By the time we should return to Santa Fe ten days later, we would have covered a rough 1200-mile circle, going north from Santa Fe to Taos, on through San Luis valley to Mesa Verde cliff dwellings in southwestern Colorado, from there through the Navajo country to Chaco canyon with its great ruins of Pueblo Bonito and Chetro Kettl, continuing on to Zuñi and Acoma, thence farther south to the ruins of Gran Quivira, and returning via Comanche pass to Santa Fe.

This tour acted as a touchstone evoking from Dr. Lummis a flood of memories of his early days in the Southwest. He had covered this entire territory on foot or horseback, and it was like a renewal of his youth once again to visit these historic scenes.

As our line of cars started northwest, heading for the Rio Grande and the Indian and Spanish-American villages of that river valley, we were reversing the route by which Lummis had entered New Mexico on his notable transcontinental hike of 1884-85. In the evenings, as our group gathered about camp fire or hotel board, we learned interesting bits of Lummis' past.

“Life really began for me,” he related, “one hot September morn in 1884. With a course at Harvard and several years of newspaper work behind me, on that day I turned my back upon the East where I had spent the entire 26 years of my life, and set out on an adventure which was to determine the whole future tenor of my life.

“I was an American,” he continued, “and I was ashamed to know so little of my country. So when an offer was made to me of the city editorship of the *Los Angeles Times*, I determined to fulfill a boyhood ambition to tramp across the continent.”

Nearly a half century later he recalled how, clad in a light knickerbocker suit, a hunting knife at his side, his capacious pockets stuffed with writing materials, revolver, fishing tackle, tobacco and matches, and concealed beneath his clothes a money belt filled with \$300 in small gold pieces, he eagerly set out from Cincinnati. His knapsack and rifle were sent ahead by rail to be picked up along the way.

“By the time I reached Los Angeles nearly five months later, I had covered 3507 miles replete with interest and adventure. Although this tramp cost many times the price of a railroad ticket, it was worth infinitely more in the experience, the rich fund of information and the physical enjoyment it afforded. It taught me more than all my years at Harvard.”

Each week along the 3507-mile route the young adventurer forwarded a letter to the *Times* describing his impressions and experiences. These letters, appearing under the signature of “Lum” and later incorporated into a book titled “A Tramp Across the Continent,” made spirited reading.

“By the time I had crossed the midwestern states and touched the Colorado line I was no longer a tenderfoot,” Lummis said. “My feet were by then in a condition comparable to that of Sal, a bare-foot Georgia girl warming herself by a fire. Upon her mammy’s exclamation that there was a live coal under her foot, Sal drawled, ‘Which foot, Mam?’

“There was no such thing as ‘thumbing’ a ride in those days. The real hardship of tramping, however, was the abominable food served at wayside eating places, aptly described in a current song:

‘His bread was nothin’ but corndodger,
His beef you couldn’t chaw,
But he charged you fifty cents a meal
In the State of Arkansaw!’ ”

Ardent champion of Indians and Spanish-Americans, Lummis admitted that on this initial trek across country, although he had shaken the dust of the East from his shoes, he had not yet

Patio and fountain of Lummis’ home El Alisal, showing giant sycamore which gives house its name. Southwest Museum photo, taken March, 1904.

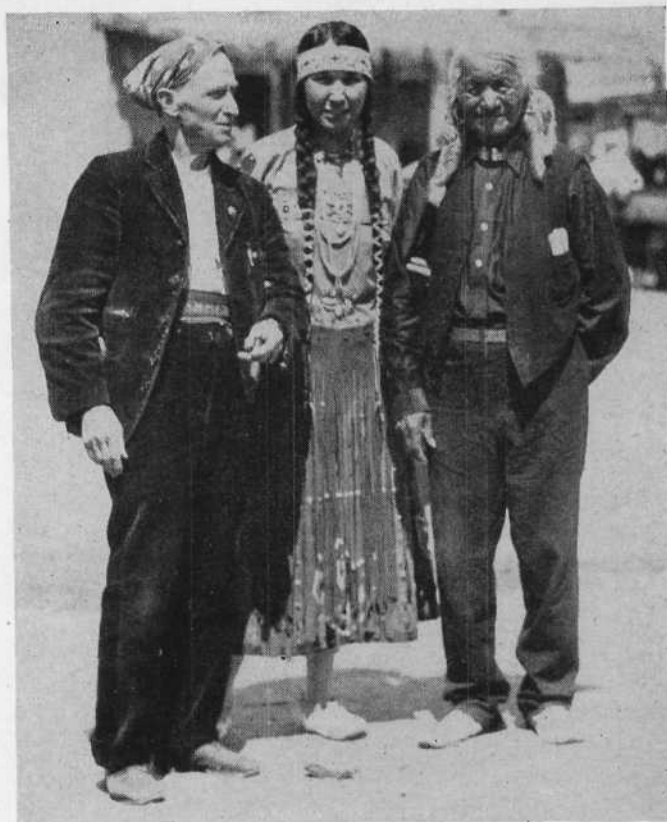


succeeded in shaking all his eastern prejudices. "When I crossed the line from Colorado into New Mexico and advanced down the Rio Grande with its quaint Mexican villages, I was very suspicious of the dark-skinned inhabitants. Rather than approach these people, at first I went hungry. Why is it," he queried, "that the last and most difficult education seems to be that of ridding ourselves of inborn race prejudices? We all start with it; unfortunately few of us graduate from it. Virtue and vice are individual, not national traits, and we as a nation should realize that when God made mankind he did not sand all the sugar but ours."

After our archeological party had visited Taos where, to repeat Lummis' classic description, "you may catch archeology alive," the next chief stop on our itinerary was at the incomparable Mesa Verde cliff dwellings in southwestern Colorado. There, Dr. Lummis, as avid as ever for a fine "shot," made us hold our collective breath as heedless of danger he adjusted his ponderous camera and tripod on the brink of 500-foot cliffs. Throughout a period of 40 years he had been assembling a fine documentary collection of southwestern photographs and all of these pictures now have become a permanent possession of the Southwest Museum of Los Angeles.

A few days prior to our visit at Mesa Verde, the Crown Prince of Sweden and his wife, both archeological enthusiasts, had visited the cliff dwellings, crawling in and out of small doorways into the deepest recesses of the dwellings and exclaiming over their remarkable construction. Commenting upon this visit from European royalty, Lummis was moved to repeat what he had been harping on for nearly a half century: "We live in the most

Young Lummis about the time he took his tramp across the continent. Southwest Museum photo.



Lummis with Tsianina, noted Cherokee Indian singer, and his friend Santiago Naranjo, at Santa Clara pueblo, New Mexico, 1926. Photo by Odd S. Halseth.

wonderful of lands, yet we hasten abroad in quest of sights not a tenth as wonderful as countless marvels we have here at home. Too many Americans think that 'to travel' means only to go abroad. More and more I hope that Americans will be proud of knowing their native land and ashamed not to know it."

Another highlight of our tour was our visit to the "Sky City" of Acoma, in Lummis' words "the most wonderful aboriginal city on earth." He first had visited Acoma during his walking tour of 1884-85. Martin Valle, governor of the pueblo and host of Lummis at that time, was no longer alive to greet his friend.

"It was Martin Valle," Lummis explained, "who told me the startling tale of the *Mesa Encantada*, which centuries before had been the home of his people. He related to me that a violent storm had broken away the rocky trail which was the sole means of access to the mesa top and that the old people stranded there had died of starvation. My publication of the story of the Enchanted Mesa was branded by certain Eastern critics as a figment of my overly active imagination. But the last word was mine!"

The battle of words which ensued between Lummis and his assailants, in particular Professor William Libbey of Princeton, was waged intermittently for several years. In 1897 the controversy finally was settled in favor of Lummis when Dr. Frederick W. Hodge, then of the Bureau of American Ethnology, succeeded in ascending the mesa and in proving conclusively that the legend as related to Lummis by Martin Valle was based upon actual human occupation. The spring following Dr. Hodge's ascent Lummis, with a number of companions including his six-year-old daughter Turbesé, ascended the 431-foot mesa. Fortified with his own finds Lummis proceeded in various newspapers, periodicals and his own *Land of Sunshine*, to flay his critics with caustic humor and to vindicate the tradition of the Acomas.

Lummis always enjoyed a contest of wits or physical endurance. He and Theodore Roosevelt had many characteristics in common: an intense interest in the West and its people, an infinite pride in their own physical development over handicaps, and

an unbounded faith in themselves and the strenuous life. Lummis' eyes still gleamed as he recalled the incident of his undergraduate days at Harvard which began for him a lifetime friendship with Roosevelt. On the Harvard bulletin board one day the following notice appeared: "If Freshman Lummis doesn't get his hair cut, '80 will do it for him." One half hour later a reply was posted: "Lummis '81 will be glad to meet the tonsorially inclined of the class of '80 individually or collectively at any time, at 16 Holyoke."

A short time after the posting of his defiant notice Lummis met Roosevelt whom until then he had known only by sight. Grinning at him amiably the admiring Teddy exploded, "Bully for you! It's your hair! Keep it if you want to, and don't let them haze you."

Although Lummis learned Greek at the age of nine years he never learned to apply the Greek philosophy of moderation. He worked at a terrific tempo, rarely getting more than one or two hours of sleep out of the 24 during his three years on the *Times* staff. The inevitable result was that he burned himself out. In December, 1887, when still in his twenties, he was stricken with paralysis, and his left arm which had been broken during his transcontinental hike and which he had been compelled to set himself, became helpless. His illness, however, proved to be a boon in disguise, for he now carried out his dream of returning to New Mexico.

The pueblo of Isleta on the Rio Grande became his home for the next four years. He refused to give in to his physical infirmities, and despite two additional strokes he undertook extensive exploration of the country on foot and on horseback, gathering historical data, studying the languages, lore and customs of Indians and Spanish-Americans, taking thousands of pictures and collecting native songs.

Of his experiences with paralysis, from which he eventually completely recovered, he said, "It was the luckiest thing that ever befell me. It taught me that man was meant to be, and ought to be, stronger than anything that can happen to him. If I couldn't have what I wanted, I decided to want what I had—this simple philosophy saved me." A psychologically interesting description of his fight to overcome paralysis is contained in a small volume by him entitled "My Friend Will."

The collecting of unrecorded Indian and Spanish-American songs which was begun in this period in New Mexico later was continued upon his return to California. Knowing the danger of extinction of countless folksongs which had been brought from Mexico and Spain, Lummis tracked down every possible native singer and recorded hundreds of songs on wax cylinders. Unfortunately the great task of transcribing these selections has precluded their becoming available to the public. Fourteen of the most delightful of these songs, with translations by Lummis and piano accompaniments by Arthur Farwell, have been published under title of "Spanish Songs of Old California," and include such pleasing numbers as "Adiós, Amores," "El Capotín," and "La Noche 'sta Serena."

It was during this period in New Mexico that Lummis met and became a close friend of the noted Swiss ethnologist and historian, Adolph Bandelier. Bandelier and Lummis on a tramp in 1890 together explored in the Pajarito plateau the cliff dwellings of the *Rito de los Frijoles*. These prehistoric dwellings became the setting of Bandelier's novel, "The Delight Makers," which was illustrated by photographs taken by Lummis. Lummis subsequently accompanied Bandelier on an ethnological expedition to Peru and Bolivia. Peruvian legends collected by Lummis on this expedition appeared in his book, "The Enchanted Burro."

Lummis carried a scar under one cheek bone, along the line of his mouth—the result of a close call during his sojourn at Isleta pueblo. As the cars of our touring party passed the isolated, windowless *moradas* of the *Hermanos Penitentes*, Dr. Lummis

recalled the incidents which led up to the acquisition of the scar.

His study in the late 1880's of the *Penitentes* who practice flagellation and crucifixion during Passion Week led him to seek permission to be the first to photograph their rites. This permission was granted by some of the chief Brothers. There were among them, however, certain members who bitterly resented this privilege being accorded an Anglo intruder, and who threatened to "get him." Late one dark night Lummis was summoned to the door of his Isleta home by a loud knock. Upon opening the door he could see no one in the darkness, but the silence suddenly was broken by a volley of shot. Five slugs struck Lummis and seven more penetrated the door. Only the fact that he had a thick manuscript in the pocket over his heart prevented a possibly fatal shot.

This shooting fray had a romantic outcome. The Indians called upon their young government schoolteacher, Eve Douglas, to help nurse Lummis, and not long thereafter the friendship of nurse and patient ripened into love and marriage.

The importance of Lummis' writings is not only in their pioneering work of acquainting America with an almost unknown Southwest, but in their literary value as well. Some of his books are of historical and ethnological importance, but most of them have a more personal quality. They are luminous, entertaining reports of a discerning observer, and one who had a profound sympathy with and understanding of the Indians and Spanish-Americans. The fact that after 30 and 40 years they still are being read by the public is sufficient to indicate their lasting value.

Edgar L. Hewett has said that his "Mesa, Cañon and Pueblo" is a book that "can never be displaced. There are parts of the world no one would travel in without a copy of Herodotus or Pausanias, and it will be so till the end of time. So, the traveler in the Southwest will not be fully equipped, be it centuries from now, without a copy of this latest book by Lummis, as well as some of the earlier ones."

It was in "The Land of Poco Tiempo" that he wrote the first account of the Penitente Brotherhood. In this book too are included some of the folk songs which he collected intensively over a period of seven years. "Bronco Pegasus" includes more verse and songs. "A New Mexico David," "King of the Broncos" are other volumes of New Mexico stories. Among his historical writings are "Flowers of Our Lost Romance" and "Spanish Pioneers."

Returning to Los Angeles with his wife and small daughter Turbesé in 1894, Lummis began the construction of a home which was to take 17 years in the building. The 14-room rock castle, El Alisal, situated on the Arroyo Seco in what was then a sycamore grove, was built by Lummis with his own hands assisted by an Indian boy and any friends who happened to be visiting him at the moment. Congregated there on almost any night could be found scientists, writers, opera singers, actors. Whether entertaining cowboys or presidents, Don Carlos always wore his unconventional brown corduroys. His rejoinder to remarks about his dress was, "I don't change my face for company, so why change my garb—as long as both are clean?"

The Lummis home located at 200 East Avenue 43 on the edge of the Arroyo Parkway in Highland Park, recently has become a state monument. It is being maintained and administered by the Los Angeles park department which hopes soon to open it to the public. The grounds are to be planted with desert trees, shrubs and flowers, particularly those used by the Indians of Arizona and New Mexico for food, medicine and other economic purposes. On display in the house will be many of Lummis' books, pictures and Indian artifacts which, upon his death in 1928, were left to the Southwest Museum.

In the ever-growing interest in the Southwest the influence of Charles Fletcher Lummis, pioneer advocate of "See America First," still lives.

Photographing Quail Babies in the Desert

By JOHN L. BLACKFORD

FROM the shimmering silver flats of jumping cholla that reach away to the mystic Hieroglyphic mountains of central Arizona, I came dodging through thorny mesquite scrub along the Hassayampa river to discover the quail's nest. A young Abert's towhee had led the chase and posed for the first photographs. Twice, in pursuit of him, I had dashed through a tiny "island" of tall withered grasses beside a scraggly mesquite tree. Yet I remained completely unaware of the treasure hidden there.

Then, in the circuitous hunt, I stepped directly over the flattened bird under her arching canopy of long, dead grass stems. With an explosive whirr of wings, she flushed swiftly from her eggs. There were 20 of the creamy ovals in the deep nest hollow. All were freckled with dots and blots of purplish brown. This told that it was the home address of a desert or Gambel's quail.

The number of eggs in a nest may range from eight to 22. They are short-ovate in shape, and pale ivory-yellow, cream color or cream buff, spotted and blotched irregularly with golden brown or purplish brown.



This baby desert quail, less than one hour old, didn't want to pose for John Blackford's camera. But an ancient cottonwood leaf appeared to give him momentary feeling of comfort and security. During few seconds that he was quiet the camera captured his portrait.

The desert quail's great fecundity is necessary for survival against such natural enemies as snakes, owls and coyotes. And although their enemies are many, their nests usually are more exposed than those of the chaparral species of California. It may be just a depression in the ground lined with grass or leaves. But occasionally

it is placed on top of a stump or on a low horizontal limb or even in a protected nest of another bird.

Carefully I drew back the grass blades which sheltered the unusually large clutch of eggs, and soon the camera peered into the nest from its tripod. For the second shot several eggs were turned over to pre-

Left—Concealed by tall dead grass in a mesquite thicket, author-photographer discovered the nest with 20 eggs. The cream-colored ovals splotted with purplish brown told him they were those of a Gambel quail. Right—While Blackford was still counting the eggs they started to pip. Immediately striped chicks came tumbling out of neatly uncapped shells and started exploring the outside world.



sent different markings. Three had just pipped. In all those long, tedious days of incubation I had come at the magic moment!

It was a close race to re-focus the camera and secure this additional picture of unhatched eggs before the chicks came tumbling out of their neatly uncapped shells. Each oval was chipped open quickly with a surprisingly even, circular cut around the larger end.

When the striped, downy suits of the youngsters had dried a bit, I was ready for photographs but they were not. The fuzzy first comers seemed intent on exploration. Half a dozen at a time, they scrambled over the rim of the hollow and penetrated the weedy maze around it. Their damper brothers and sisters were almost never still. With only two hands I finally assembled everybody in the nest and snapped the picture. Then the grassy thatch was replaced with care.

The adult male of the desert quail is somewhat similar to California's valley quail in the general pattern of head, chest and upper parts, but the black of his throat is barely bordered by white below and the black on his forehead and forecrown is much more noticeable. Both crown and nape or collar are bright chestnut. His saucy crest is a bit longer, but less sharply recurved and is inclined to brownish.

The chest, sides of breast and the tail are slaty grey. Feathers on the sides and back of neck are lightly bordered with distinctly-ribbed chestnut. Remainder of the back,



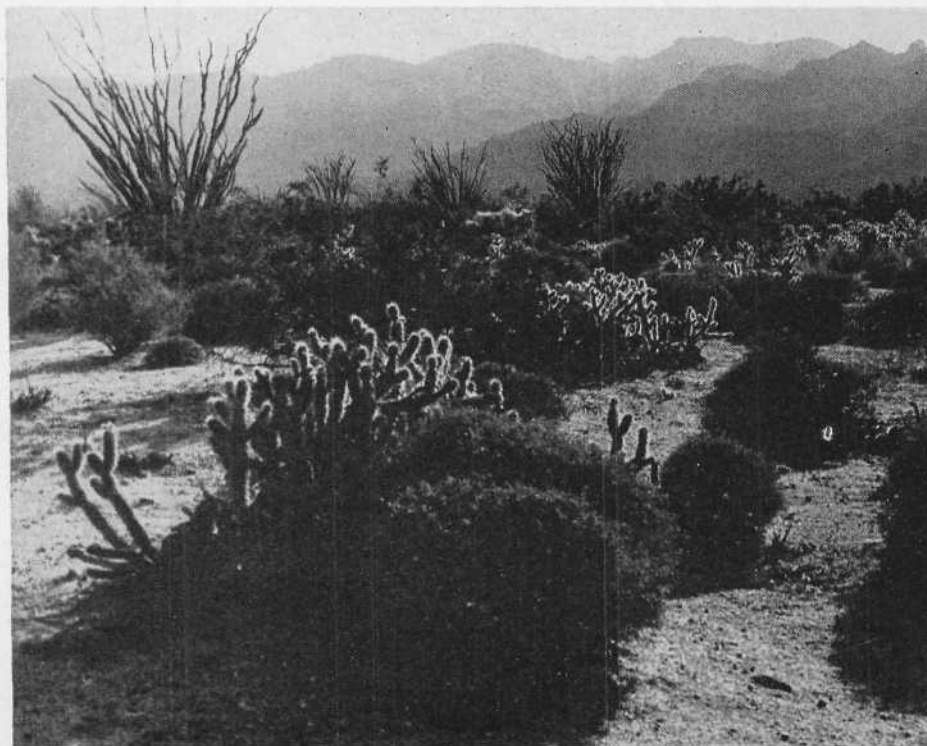
Adult male of Gambel quail, called by ornithologists Lophortyx gambeli. His crest is a bit longer, less recurved than that of California valley quail, the black about his head more noticeable, the scaled design underneath lacking, but upper belly distinctively black. About 10 inches in length.

National Park Service photo.

wings and upper tail feathers are light brownish olive or buffy olive. Sides are rich bay striped with white; lower breast is plain brownish yellow or buffy. Upper belly is black, but lower belly is like the lower breast.

Desert quail are at home among cholla, ocotillo and incienso bushes in Lower Sonoran plant life zone, south of Coyote Wells, Imperial county, California.

Photo by Phil Remington.



General coloring of the female adult is similar to the female valley quail, except the white markings on back of the neck and the abdominal scale-like bordering are almost non-existent and is more like the color of the male of its own species. Her sides are similar to the male's but the bay coloring is somewhat restricted. The immature quail and chick, although having similar markings to the adults, are considerably lighter in tone, with more grey and less brown.

Their favorite haunts are among the atriplex or salt bush, the mesquite and arrow-weed thickets or creosote plains, which are characteristic of the Lower Sonoran zone from southern California to the El Paso, Texas, area and northern Mexico. They also are found in the stunted forests of piñon pine and juniper and in the saguaro cactus and palo verde regions. Their presence always indicates nearness of water on the desert, for they must visit a watering place morning and night.

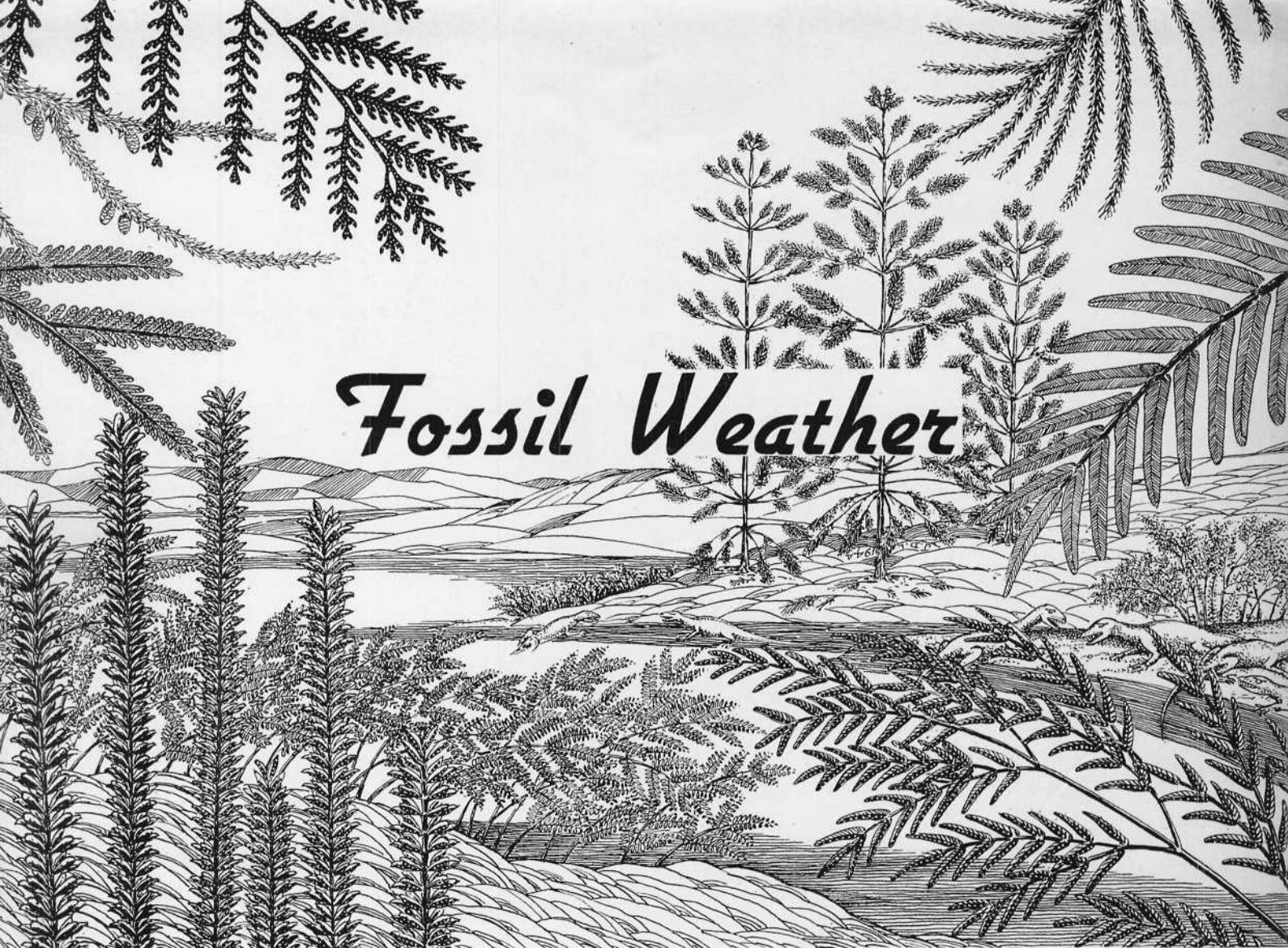
The cock's clear call from his yellow-tasseled mesquite perch, or the old birds' escort of their extensive covey to a favorite waterhole are familiar rituals of the desert morning throughout the Southwest.

His call is described by Roger Tory Peterson as a querulous three-noted *chi-quer-go*, somewhat more "drawling" than the California quail.

In the retreat where I found this prize nest, an occasional huge cottonwood had strayed into the mesquite growth from the nearby curving banks of the Hassayampa. Taking an old slab of the great tree's bark, I laid it on the sunny floor of the thicket.

When I again reached into the hollow, drew forth a fluffy youngster, and rested him upon the rough bark slab, the chick objected to the mounting heat. Superlatively energetic, and 15 minutes older, the quail baby was as difficult to pose as the entire nestful had been shortly before. But an ancient, broad, cottonwood leaf, laid upon the bark to cradle him, appeared momentarily to lend comfort and security. In those few, fleeting seconds of stillness the camera captured his portrait. Again placing the precocious babe beneath the roof of the little grass "hut," I slipped quickly away. An hour later, as I returned through the cacti and mesquite to make sure of their safety, the old quail was hovering them—and having no trouble at all.

Although Gambel quail eat weed seed, grain and wild fruit as do their western cousins, such fare is scarce in the desert. As a result two-thirds of their diet consists of browse—tender leaves and shoots of various plants, especially mesquite. In winter, they peck at the buds of mesquite and willow. And they will reach the very tops of mesquite trees for a feast of mistletoe berries.



Typical plant life in northern Arizona during early Permian period. Beginning upper left corner, reading down—*Yakia*, *Ulmanina* (branch with cones), *Callipteris* (branching frond with fern-like leaves), *Sphenophyllum* (erect plant, left foreground). Lower right—*Supaia* (branching frond), *Brongniartites*, *Walchia* (tip of branch with twigs). Middle left distance—Thicket of fern-like plants (*Supaia*, various species). Middle right distance—Three *Walchia* trees. Lizard-like reptiles are *Ophiacodon mirus*. Plants reconstructed by Laudermilk from "Flora of the Hermit Shale, Grand Canyon, Arizona," David White.

It is two hundred million years ago. We are standing shivering in the early dawn of northern Arizona. As the feeble starlight pales before daybreak a strange land is revealed—not the snowy San Francisco peaks, the deep cut canyons and monumental mesas we expect to see—but a monotonous broad basin bounded by low hills, something like a series of badlands gullied by thousands of arroyos—grey, red, brown and ultramarine blue. The dawn is very red from extremely fine dust constantly suspended in the air. The soil is bare. Only near the pale pools glimmering in the distance has the sparse amphibious plant life strayed a little from its watery abode . . . This is the prehistoric setting which paleontologists have reconstructed from the records in the rocks—records which tell them the kind of weather that existed in the Southwest during those far off days of the Permian period.

By JERRY LAUDERMILK

Fossil specimens in Webb School Museum, Claremont, California
Collected by Ray Alf and photographed by Frank Ordway, Claremont

THE DESERT seemed to purr like a good-natured cat. It was early summer. Following the slow rain during the night, morning found the grim old desert in a playful mood. All along the trail winding south toward Kane spring, the usually hard look of the Mojave desert was mellowed by pools of clear cold rainwater filling natural basins in the weathered lava. Abundance of water had put all the desert dwellers—

flowers, chipmunks, chuckawallas and possibly even the snakes, in a holiday mood.

When we stopped to eat our lunch in a small cave in the lava flow we found that we were not the first human intruders who had felt this effect of expansive generosity of the desert. Long, long before, some Indian had expressed his sentiments by inscribing a few lines in the form of a rain symbol clearly under-

stood in any man's language. From a horizontal line, the sky, there hung vertical rows of dots like a curtain, rain. It said as plainly as print, "plenty water." This was a weather report and doubtless one of the earliest from that part of the Mojave.

The keeping of accurate and systematic weather records is a modern institution. The ancients had nothing like it. Some specially hot summer or cold winter might be recorded, but the ordinary weather, the little seasonal features that make conversation, were lost in the shuffle of the centuries. But with the weather records which are the subject of my story this was not true.

Petrified Weather Record

Ancient weather frequently has been petrified, the signatures of its agents being engraved in the rocks. The stories they have to tell are, with few exceptions, about familiar things that happened on this planet in past ages. Then as now the same winds blew. The same rain fell and the same hail knocked twigs and buds from plants whose likenesses are known only from their portraits impressed on slabs of shale. The same sun's heat cracked the mud and slime of inland pools for eons gone and the same cold left impressions of ice crystals in the mud of swamps inhabited by life that existed even before the dinosaurs.

Some of the richest sources of these ancient weather records are the sedimentary rocks of northern Arizona where the Hermit shale, the Supai and Kaibab sandstones and others of the old red strata are exposed in the walls of Grand Canyon. Most of the weather records are found in the strata laid down during the Permian period a couple of hundred million years ago when weather seems to have been one of the biggest products. Events leading up to this period of geologic time were these:



Fossil mud cracks from Triassic period of Arizona. At AA are parts of silt-filled mud cracks which, being harder than the matrix rock, stand in relief.

Age of the Giant Plants

The Carboniferous period gradually had closed down after turning out a spectacular profusion of swamp-dwelling lowland plants. Seed-ferns, giant bullrushes, clubmosses big as pine trees and many other weird forms grew riotously under the warm-temperate and possibly always cloudy skies of the age when most of the coal beds of the world were parts of living things. The Carboniferous was the great period of swamp plants and giant insects. Afterwards came rumors of the advancing Permian, like hints of a depression about to follow close on the heels of a boom.

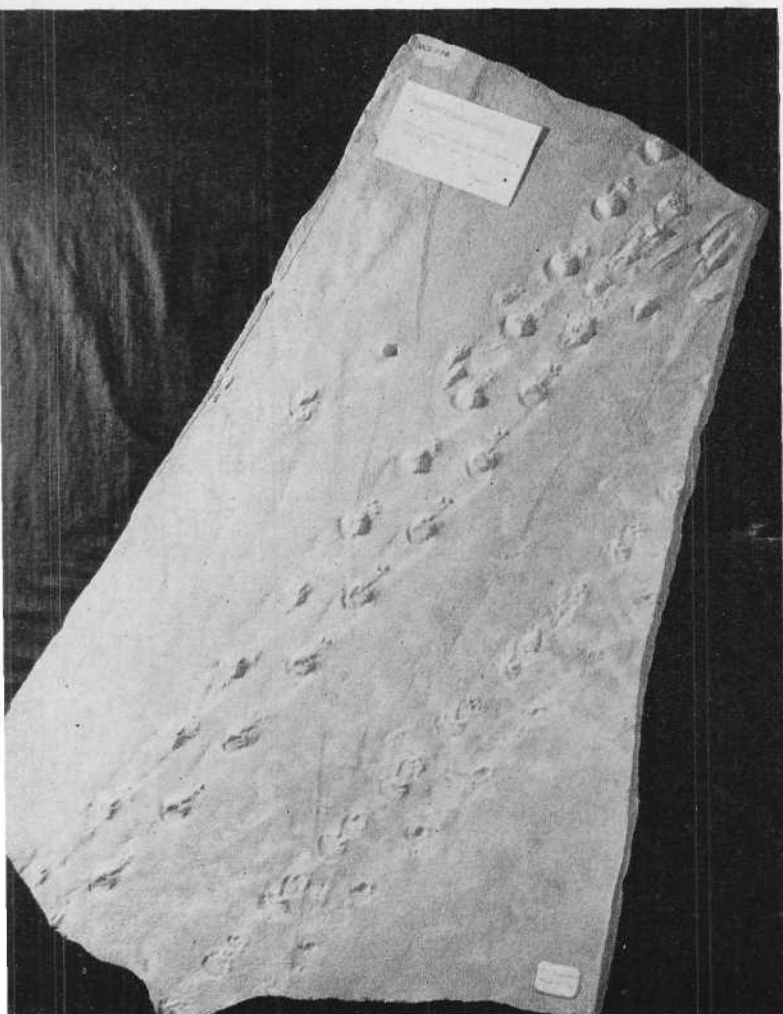
Maybe that is precisely what the Permian was—the slump after a time of "too much plenty." Possibly the vast accumulations of carbon dioxide that had filled the primitive atmosphere from the earlier ages had acted like a blanket to hold in the heat of the sun's radiation. In any case, there had been enormous volumes of the gas present because this had been largely withdrawn by the plant life of the time of greatest coal formation. So from this or some other cause, there came a general fall in temperature and the old established routine was disturbed. Mountains were upheaved in some places and worn down in others. This was true of some once extensive range which when leveled furnished the sediments to make the red shales and sandstones of Arizona.

Permian Age Semi-Desert

Red is the typical color of the Permian sediments everywhere in the northern hemisphere. It indicates the limit of oxidation of iron minerals in the soil. During the Carboniferous, oxidation was retarded by the enormous amounts of humus and products of decay in the soil of the old coal forests. Today where such conditions exist, iron carbonate and other ferrous salts are the products. These are greenish or light colored and not red. With a loss of carbon dioxide from the air and a resultant slowing down of plant growth, the oxygen had a chance to work uninterrupted, and the typical red, oxidized sediments were formed.

This red color of sedimentary layers, not just reddish soil, is an indication of deposition in a dry climate, and since the red

Tracks of a lizard-like reptile that lived during lower Permian time in northern Arizona. The lizards crawled over the clean-washed sand shortly after the water receded. Probably part of a sandbar.



sediments were laid down under water which in many instances evaporated from closed basins, we are bound to conclude that much of the northern hemisphere was a combination of desert and semi-desert interspersed with lakes and pools much like the temporary lakes of the desert today. These were fed by streams which during times of rapid runoff carried in silt from distant sources.

The microscope reveals some interesting features about the old, red Permian silts now consolidated into rock. It shows fragments of quartz and feldspar with not enough clay to produce plasticity. The red pigment frequently occurs as a coating on the mineral grains or as scattered material in the cement but is not the cement itself which is usually calcite, dolomite or sometimes silica. The sand in these rocks has either angular or subangular grains and has not been handled much by water. Aeolian sand with typical round and polished grains occurs sometimes.

When these rocks were mud it had just the right composition to take the weather impressions to best advantage and atmospheric conditions were just right for their preservation. What conditions were like in the northern part of Coconino county during the Lower Permian can be reconstructed from the evidence we find in the Hermit shale and other sources. A typical scene may have been like this:

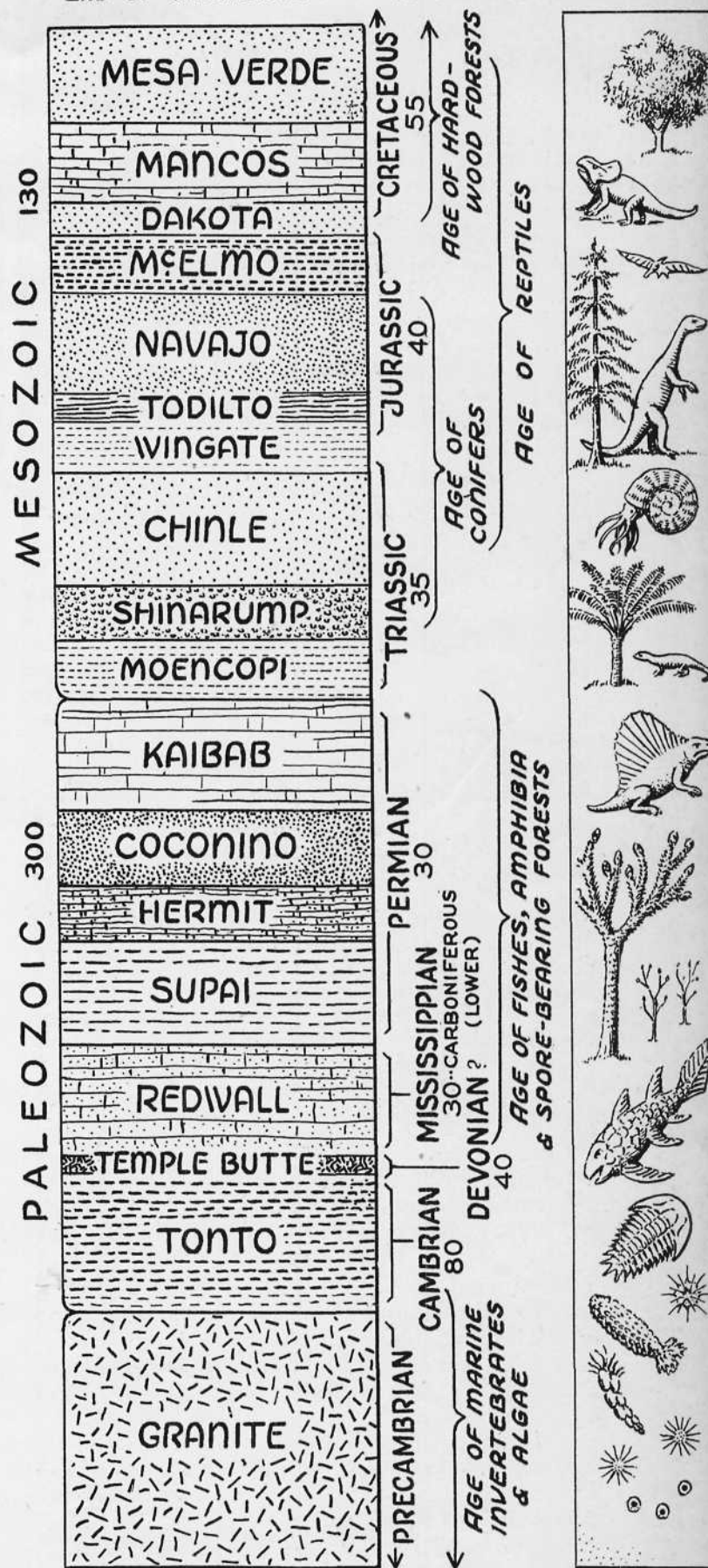
The early morning hours were shivering themselves toward daylight but it still was too dark to see much of the landscape. It was a strange land with some of the features of a desert so far as could be determined by the feeble starlight. Close by there seemed to be nothing but fine sand and silt which now and then was rippled into little swirls and streams by a north wind—the cold wind of the desert just before daybreak. Off in the distance, pale glimmering pools reflected the light of constellations none of which would be recognizable today. This was at least 200,000,000 years ago and even the shapes of the constellations change with the passing ages. The only sounds that broke the quiet of this Permian dawn were the whisper of the wind as it played in the sand and a distant chorus of croaks, bellowings and gargling noises from the amphibians and reptiles that lived in and around the pools.

After a tremendous red dawn, red from extremely fine dust always suspended in the upper air in those days, daylight came with a rush. The topography of the country soon was visible. Unlike the present desert landscape of mountain, canyon and mesa this tended toward the monotonous—a broad basin bounded by low hills on the order of badlands, gullied by thousands of arroyos which were free from the larger rock fragments typical of most of the arroyos we know today. Evidently there had been ages of this surface dessication and erosion because older fans and older arroyos had been buried under more recent deposits. Shades of grey, red and brown and the ultramarine blue of desert shadows were the basic colors of the landscape. In the distance there was a range of bleak hard-outlined hills but no impressive mountain range in sight. In some places dunes of paler desert sand marched slowly before the wind.

The soil was bare of anything resembling grass or even low herbage, but nearer the extensive pools that stretched away northward, sparse scattered plants began to appear, sometimes brilliant green by contrast but usually dulled by a layer of dust. These were dwarfish land-dwelling outposts of a plant that was amphibious but preferred the water where it grew abundantly as an attractive herb three feet high, flowerless and with leaves in whorls around a straight stem. This plant and a profusion of fern-like types were the predominant vegetation. They grew densely in the swampy soil around the pools and along the sides of the lower arroyos.

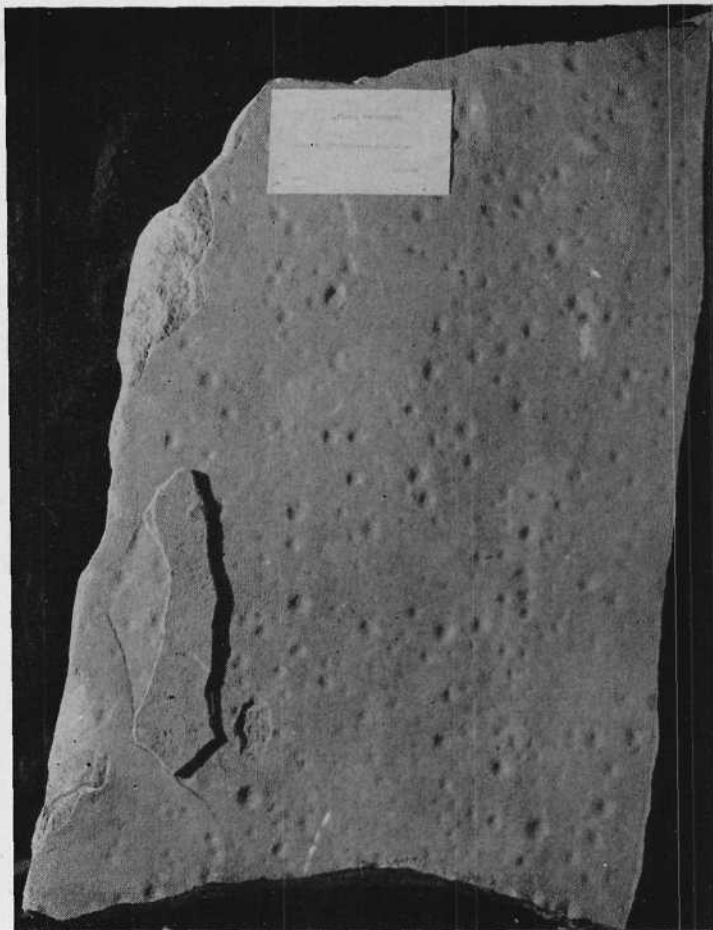
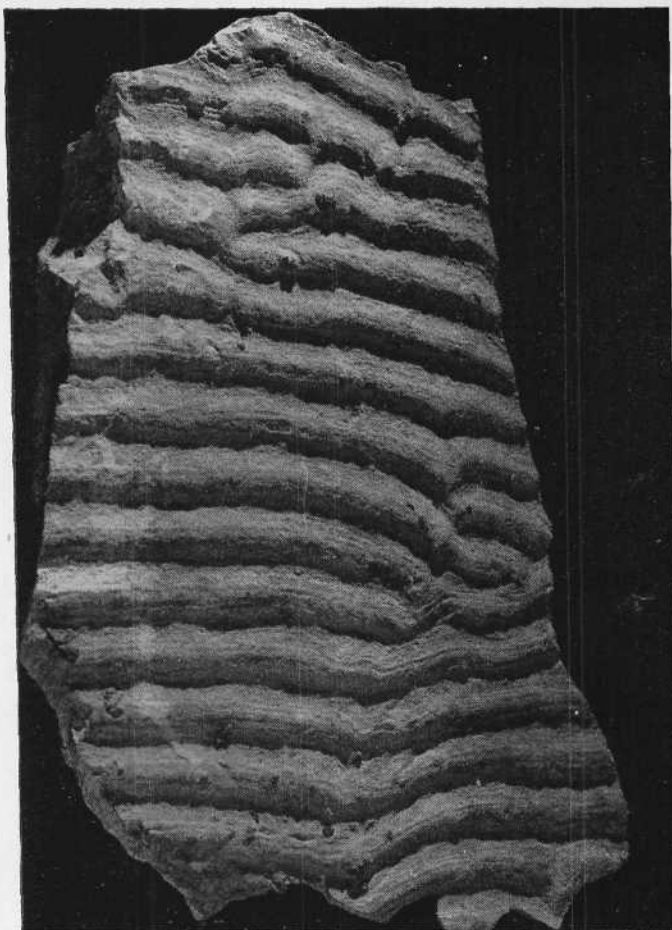
Bigger, tree-like forms were rarer and all were of the conifer

END OF CRETACEOUS 60 MILLION YEARS AGO



(NUMBERS INDICATE MILLIONS OF YEARS)

Geologic chart, applicable to northern Arizona, showing predominant plant and animal life of different ages. Compiled from various authorities and drawn by Norton Allen.



Left—Fossil ripple-marks from Triassic period, Arizona. Distance from ridge to ridge is 1½ inches. Right—Fossil raindrop impressions 200 million years old. Permian period, Arizona.

type. These had thin, radiating branches that ended in plumelike sprays of twigs like those of the Norfolk Island pine. Smaller plants were absent although green pond scum covered the more stagnant pools. You could have searched all this vegetation inch by inch without finding a solitary flower or blade of grass. It would be millions of years yet before either of these appeared to decorate the landscape.

Fossil Weather in Coconino

Times were hard during the Permian. Lack of water appears to have been one of the universally adverse conditions. When there was water it generally was in the wrong place or there was too much or too little, as was about to happen in the present case.

It was midmorning. Beneath the sun, which shone unusually hot through the moistureless air, dust-devils danced across the dunes and swirled away in reddish columns. At length the wind fell and in the west, beyond the hills and sand dunes, a solitary black cloud began to form. As it drew closer it took on respectable proportions; some rain fell. As is frequently the case with dry weather showers only a paltry amount of water fell in scattered drops. This thin shower that lasted only about ten minutes seemed to be all there was to it. The cloud vanished. The sun came out and the landscape settled down once more into its chronic condition of dessication.

This one feeble attempt at a rain storm only emphasized the long dry spell. The water in the pools was at low ebb from evaporation but in places where sand-spits had been covered by the lapping waves when the wind blew in the morning, the mud was wet enough to take the impressions of the raindrops left by the passing shower.

Records in the Rocks

Hot day followed hot day monotonously for months. The mud dried to a stony hardness. It was dry heat without a breath of wind to carry sand or dust to mar the cleancut impressions of the rain pits. Then one day, far away in the hills, the rain began in earnest. The streams in the arroyos which fed the pools ran torrents of water thick with mud. Millions of tons of silt were carried into the pools which were muddied to the bottoms. Much fine soil stayed in suspension for days and when this muddy water evaporated it produced a slime which dried into a thin hard coating on everything. Some plants were buried upright as they grew along the streams and today their fossils, taken from the Hermit shale, have the impressions of even the tiniest veins and hairs preserved so perfectly that the species represented by even a fragment of leaf is entirely identifiable to a paleobotanist.

Where this muddy water spread in a thin layer over the rain-drop impressions, the thirsty hard-baked soil absorbed the water with such avidity that the tiny particles of silt were drawn into the impressions with the perfection of a cast in plaster of paris. This mud layer dried and was added to by fresh layers until all traces of the rainstorm of months before were sealed between the layers of silt. More dry weather followed and baked the layers of mud all together. Eventually, these layers of hard-baked silt became rock and so, after the passage of millions of years, a single stroke of a geologist's pick may expose again to daylight the record of a brief ten-minute shower that poured on a younger and weirder earth. Countless such records of small weather-phases have been preserved.

A specimen from Arizona, now in the museum of the Webb School for Boys, at Claremont, California, shows on a slab of

fine-grained sandstone the record of one of the little tableaux enacted by the midget things that live close to the soil after any summer rain. Tiny pieces of buds and the petioles of leaves with small twigs and branches have left their record on the rain-pitted ground—then some earthworms came crawling about to look over the damage done by the storm, and tracks, twigs and all now are imperishable rock.

Sometimes the dry spells lasted for just a few days, in other cases they lasted for months or perhaps years without a drop of water falling and then the mud flats dried out just as they do today and were covered with a network of cracks which assumed different patterns according to the composition of the mud and the length of time it dried. Ordinary mud with little sand cracks a great deal from shrinkage. With much sand there is very little shrinkage, but—and here is a strange exception—in some places in Grand Canyon, near Bright Angel trail, petrified mud cracks 15 inches wide and 25 feet deep were formed in an especially sandy stratum of the Hermit shale.

Some of the cracks in red shale have been filled by dune sand which could have been transported only by a high wind. In other examples the cracks stood open to the air and were filled by slowly settling particles of light colored silt from ancient storms apparently like those of "Dust Bowl" days.

Mud crack fillings usually are of a composition different from the matrix rock, and being more resistant to weathering stand in high relief to make a pattern like elf-size garden plots separated by lilliputian adobe walls. Next to these ubiquitous mud cracks, the most common of the old weather indications are the ripple marks in sandstone.

These tell of winds that stirred the surfaces of pools of shallow water. Regularly spaced, parallel lines of corrugations which may be less than an inch to more than a foot from ridge to ridge were formed on sandy bottoms by the oscillation of the whole volume of the water which produced rhythmic patterns. The preservation of ripple marks leads to some interesting questions. In the first place, the ripple effect implies the presence of a considerable body of water. In the second, for them to have been preserved as mud casts means that they had to dry out, which in turn means that the water had to be withdrawn in some way that did not disturb the pattern. Apparently this water was lost by evaporation. But it would seem that in the time required for this to happen, fragments of floating material being concentrated at the bottom of a stagnant pool would have left some trace. But

GLOSSARY

CARBONIFEROUS—Last major division of the Paleozoic age. Roughly, the halfway mark of geologic time. Age of greatest coal formation.

CRETACEOUS—Later division of geologic time, roughly terminating the first nine-tenths. Name comes from *creta*, Latin for chalk since the period was one of extensive chalk deposition.

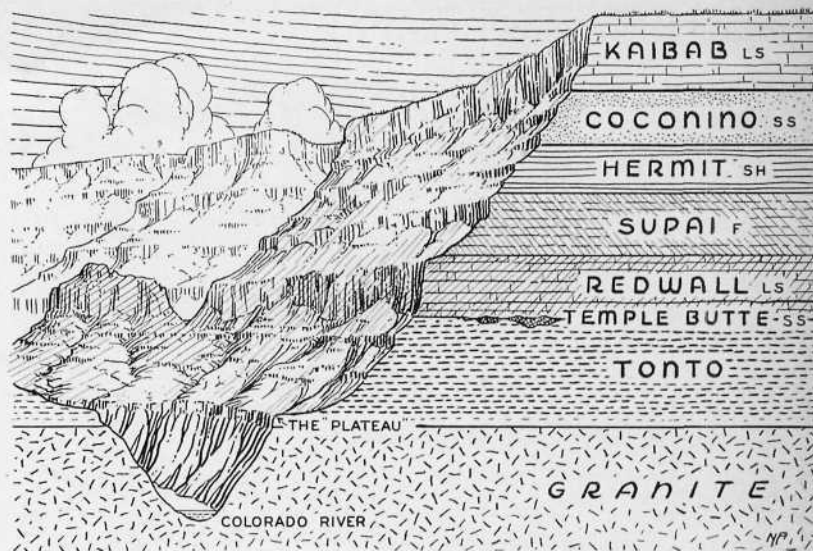
FERROUS—Descriptive of iron compounds which have not combined with all the oxygen with which they are capable of uniting.

PERMIAN—Period closing last major division of the Paleozoic. Comes immediately after the Carboniferous. Name is from Perm, a province of Russia and the classic locality.

SEDIMENTARY—A term applied to rocks composed of material deposited by water.

SEED-FERN—A family of extinct plants resembling ferns in many of their features but producing true seeds instead of spores.

SUBLIMATION—The direct evaporation of a solid substance without an intervening liquid state.



Cross section of Grand Canyon, northern Arizona, showing geologic strata which are exposed from the rim to the Colorado river below. Drawn by Norton Allen.

many specimens of ripple marked rock are perfectly clean and fresh looking. The casts were not made under water because the sand was exposed to the air while still wet. We know this from the fact that many specimens show raindrops, sun cracks and animal tracks.

In some ways the most surprising of all these old weather records are the signatures of the ice both as the impression of hail stones which then as now left a raised rim around the pit, and as crystals of ice in frozen mud.

Fossil ice crystals are not particularly rare, their apparent scarcity being due to a lack of recognition. They are found in many of the old strata but perhaps the best examples in the United States come from Lower Cretaceous rock in Texas called the Comanchean sandstone. Here we have the record of freezing temperature followed by a long, cold, dry spell. When mud freezes, part of the water separates as thin toothpick-shaped crystals. If the mud simply thaws, the shape of the crystals will be lost in the soft mass. But a quantity of ice in dry air at a below-freezing temperature eventually all will disappear by sublimation and leave not a trace of water behind. Apparently here is what happened in the case of the specimens from Texas:

Mud and sand banks froze during a time of exceptionally cold weather. In all probability it was a dry cold winter without rain. This weather lasted long enough for the surface mud to lose all its water as sublimed ice. Warm weather came and found the impressions of the crystals now in dry mud. Hot summer followed and baked the mud hard. Finally came rain, producing a source of muddy water which preserved the impressions as mud casts. The presence of fossil ice crystals in a particular stratum was once of great importance. Dr. J. A. Udden of the University of Texas, the authority on fossil ice crystals, tells how he once turned his knowledge of this apparently useless subject to practical advantage.

During mining operations in west Texas the most desirable mercury ore was found to occur in one special horizon. This layer was without fossils and almost indistinguishable from those above and below. Mining operations would have been particularly difficult had not Dr. Udden recognized the casts of ice crystals as a distinguishing feature of the desired strata. After that keeping to the proper zone was a simple matter.

So the natural records of ancient weather, like the symbol pecked out by some long-departed Indian, come out of the past to tell us about the times that were, and somewhere the weather record of today is being preserved to tell future men of the times that are.



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WRITE FOR A COMPLETE CATALOG OF TITLES



In contrast to the ever present problem of scant rainfall on Ghost Mountain, the South family this month were threatened with a far greater danger—that of fire. Rider was the first to discover the ominous yellow grey smoke billowing above a butte only four miles from the anxious watchers at Yaquitepec. All night Marshal took his turn at sentry duty on a high lookout, ready to warn the others of the dreaded approach of the flames.

Desert Refuge

By MARSHAL SOUTH

BESIDE the weathered fence of dry mescal stalks, set upon end, General Machado, the largest of our trio of desert tortoises, slumbers in the shade. And beyond him, a half dozen paces away among the rocks, a big brown squirrel perches adroitly in the spreading crown of a flowering agave. His long fluffy tail hangs down as, with both front paws, he busily crams his mouth with the fleshy golden blooms.

But General Machado is interested neither in agave flowers nor in squirrels. He has outlived, and will outlive, many generations of them. Head extended upon the sand and flippers sprawled in limp ease, he dreams on. Life for desert tortoises is an unhurried thing. Their normal span of existence is very long. Is there a reliable formula for estimating a tortoise's age? We have never heard of one. But Rider, whose mind runs to the figuring out of the answers to scientific puzzles, has advanced the interesting theory that the concentric ridges or markings of the horny plates of the shell stand in the same relation to the creature's age as do the growth rings of a tree.

The theory sounds well founded, for the little regular ridges, which are characteristic of each plate, all follow the shape of the plate exactly, but in a regular area increase, from the center outwards. Exactly as do tree rings. That these markings represent growth rings is certain. The only point—and one that could be determined only by careful observation over a considerable period of years—is just what space of time does each ridge or ring represent. Does a tortoise add one expansion ridge a year to each plate, or several? Or does it take more than one year to add a ridge? Rider figures on settling this point in the course of a half dozen years or so. But perhaps some naturalist already has the answer.

This year the canyon wrens have been particularly numerous. Which is strange, for the nesting season was so severe, with cold and high winds, that the wrens passed up most of our ready-made nest boxes. Their sense told them that in times of stress it always is safer to be in close contact with the earth. So they picked embattled little hideouts among the mescal clumps, where the stormy winds howled impotently above their heads. Some of these nests are remarkably well concealed.

One nest was in the hollow of a decayed mescal butt that had been for many years overgrown by new plants. Access to the cavity was obtained through a narrow chink between two big fleshy leaves. Somehow the wrens had discovered this fortified little cavern, and had constructed within it a tiny nest. When we located it, it was well packed with very food-conscious, half-grown nestlings, who gaped at us with eager expectancy.

There must have been several well concealed wren nests close about the house. Because, later, the friendly concourse of young families, flitting through the trees and bushes in the wake of



Rudyard, Victoria and Rider entertain a young feathered friend.

proud parents, was quite large. The canyon wren usually is reputed to be a shy bird. But we have never found them so. Curiosity and not shyness always has been the chief characteristic of our Yaquitepec canyon wrens. Several times, when packing loads up the mountain trail, one of these pert brown mites has followed me for a long distance, slipping from branch to branch and rock to rock, getting ever closer. Sometimes they even have alighted on the shoulder-pack itself, examining it with bright investigative eyes.

Yesterday we had another visitor. The genial brown racer snake who has lived somewhere close around the house for several years, paid us a call. Each year he seems a little longer and bigger. But his disposition hasn't changed. He is a friendly, slightly mischievous humorist, with a facility for turning up in the most unexpected places. This time it was on a shelf of a storage alcove. Rider, who had gone to get a pair of tin snips out of a tool box, ran face foremost full against the snake's exploring nose. It was a bit dark in the alcove and contact with that inquisitive snout was rather startling. Rider came out of the archway with a yell, dropping the tin snips. The snake seemed to enjoy the joke. For when we got there he had his head cocked a bit on one side, his long slender body still extended a foot over the edge of the shelf. And you could have sworn that there was a mischievous twinkle in his eye. Rider had been so startled that he forgot his manners. He grabbed the fly-spray gun . . . "You—" he gasped breathlessly. "You *would* do that, huh! I'll show you!" And the next instant the smirking jokester found himself enveloped in a cloud of fly spray, as Rider worked the gun furiously.

The snake was offended. He whirled and darted for an exit so fast that, although I grabbed for him, intending to carry him outside, I missed my aim. In the semi-gloom he was just a brown whizz. "Ooah! he's gone through the mouse hole!" Victoria shrieked delightedly. "Look! he's twaveling to the outside!"

He was indeed. And when we dashed out and around the house he was still traveling. We caught a flash of a flirt of slender tail flicking like a whiplash through the ramarillo bushes. Rider shook the spray gun after it wrathfully: "And don't you come back," he shouted, "or you'll get more of the same medicine!"

But he did come back. The same afternoon, he poked his head out of a crevice of the terrace wall, near the water olla. Rider saw him and grinned. "You can come out," he said graciously. "I forgive you. But *don't* do it again."

Whether his words were understood or not, the snake did come out. Sliding leisurely across the hot sunlit gravel he went off into a mescal clump, probably in search of mice.

Yesterday brought another scare. A bigger and more general one. The threat of fire.

Now fire in the desert may sound improbable to anyone who

pictures a desert as being a barren expanse of rock and sand dune. But a comparatively small portion of the western American desert is of this variety. Most of it is what Dr. Hornaday has aptly termed an arboreal desert. That is, a dry area that supports a good sprinkling of arid zone bushes and dwarf trees. Our Ghost Mountain district is of this variety. Although fires are very different from those that range in heavily wooded sections they are something not to be laughed at.

Almost all desert plants are highly resinous. Many of them need only the slightest encouragement to burn briskly even when green. And when dried to tinder by the heat of the desert summer they are a food upon which fire feeds with ravenous fury. Especially in a high wind—and somehow there almost always is a high wind whenever a desert fire starts. Once the flames get under way the blazing fragments, swept aloft by the heat and driven by the wind, spread deadly brands over an ever increasing area. A desert fire can be a terrifying thing.

Yesterday evening, Rider came hurrying with the information that we had a fire "right in our back yard." The alarming news brought everyone running. From the rim rocks of Ghost Mountain we stared off across the desert at the ominous lift of yellow and steel-grey smoke. It wasn't a big fire, as yet. But it really was in our "back yard." It was less than four miles away. It was on the far side of a great sugar-loaf butte, so that we could not determine exactly where it was, or what was the extent of the blaze. If we had been able to see details perhaps it would have been less terrifying. As it was we could see only the sinister billowing smoke rising from behind the hill. The wind was strong, and setting directly towards us. Four miles seemed a very short distance.

"It will go up the side of that ridge fast," Rider speculated. "And it will come down this side of it very slow, as all fires do when they're traveling down hill. But when it hits the flat country..."

He didn't finish the sentence. It wasn't necessary. We were all thinking of that. And of the dense growth of yuccas and creosotes that sprinkled the lowlands in patches. We began mentally to count the number of dry sandy washes that crossed those four miles, like defense fronts between us and the enemy. We hoped that they might prove at least partial firebreaks.

"There's a good chance that, even at the very worst, Ghost Mountain won't burn much," Tanya said, her eyes roving affectionately over our tumbled mass of wind scoured boulders. "Granite doesn't offer much encouragement for flames. And our sprinkling of junipers and ramarillo bushes isn't very heavy. We're a bit different here from the lowland country. But still..."

We continued to watch. The smoke seemed to be increasing. The wind was freshening.

It was near sunset. And presently the red disc went down behind the distant wall of western mountains. Behind us a great moon, almost full, floated upward from the badlands and mingled its flood of silver with the dying, ruddy light of day. Dimness crowded the canyons and the lee of the hills as the shadows of night crept from their hiding places. A coyote broke the stillness with a far off, chilling wail.

And beyond the butte, four miles away, the grim cloud of yellow grey still hung against the twilight. It was neither bigger nor smaller.

"I don't think it's coming, right away," Rudyard said presently, grimacing with the intense effort of trying to stare a hole through the distant butte. "And, in the meantime, can't we go in and have our story-book reading?"

"I think we might," Tanya agreed. "We can't stand here all night."

I elected myself as the first to do sentry duty and settled down in a nice sheltered crevice of the rim rocks. But just as all the others moved off, Rider turned back. "If it gets worse," he said,

"please give me ample warning. I want to have time to put the three tortoises in a safe place. They've a right to their lives. And I've got to take care of them."

But the fire threat came to nothing. After a long vigil—merging in the end to regular excursions, far into the night, from the house to the look-out point on the cliff edge—all trace of smoke faded. The moon-washed desert dreamed through the night hours in peace.

Just as most of the perils and sorrows of life drift, after a period, into the limbo of forgotten things, so passed a period of very real anxiety. It left behind it, as its most acute memory, not the recollection of fear but of comedy—a comedy provided by the antics of a little, grey desert mouse.

This little rascal, whom I first noticed on one of my midnight trips through the house on my way to the lookout, was intent on getting some of the sweetness from the edge of a big iron pot of desert honey which we had that day melted to separate from the comb. The pot, now cool, hung from a hook and chain over the stove. From the nearest wall ledge to the pot lid was quite a long mouse jump. But the little grey busybody had made it. As I came past with a lamp in my hand, my first sight was of a grey tail and a pair of plump hindquarters balanced on the far edge of the pot lid.

Its attitude, as it leaned over with its head away below the rim while it nibbled at remnants of boiled-over honey and wax, was irresistibly suggestive of some portly dowager on her knees with a garden trowel before a pet flower bed. The temptation to give the bending little gnome a prod with a forefinger was too strong to be passed up. But almost in the same bounce with which it sprang away from pot to wall ledge it turned and bounced right back. Flinging me a glance of plain annoyance it turned its plump little back on me and bending over, again fell to nibbling.

Again I prodded. And again it jumped. If a mouse can snort it certainly did. And its beady eyes sparkled both daggers and contempt. Back it came again like the rebound of a rubber ball. Insulting human meddler! Over it leaned, farther than ever. Its tiny teeth nibbled lustily.

Anxious to see just how far things would go I kept up the comedy. So did the mouse. But I tired quicker than it did. By the time I had given it a dozen prods, and it had made as many leaps and returns, I decided that I had other and more pressing things to attend to. So I hoisted the pot away up on its chain—far out of the jumping range of even an enterprising mouse—and departed. The last sight I had of my persistent little friend was a rotund grey shape ambling off disgustedly across the top of the fireplace in search of new and easier pastures.

After the night, came the new dawn, with the shadows of apprehension forgotten in the yellow glint of the bunch grass against the rising sun on the mountain slopes. With the gold fountains of the tall mesal blooms swaying against the sparkling sky and the morning air shot through, as by fairy shuttles, by the darting flight of myriad bees and beetles swarming about the flower banners. Long, trailing spider webs glint like drifting wires of silver, and the junipers and the grey rocks loom sunlit and solid above the distant haze of the lowlands.

YOURSELF

*However lowly you are born,
However high in worldly place,
The Truth lies open and unshorn,
To all of us—unveiled of face.
Nor need you pause upon the brink
Because of caste or lack of pelf.
Accept it swiftly now—and drink,
For life depends upon YOURSELF.*

—Tanya South

Quailbrush and Holly Belong to This Salty Family of the Desert

By MARY BEAL

YOU MAY think of Pigweeds as obnoxious weeds but we are indebted to their family, known variously as Saltbush, Pigweed, or Goosefoot, for some of our standard vegetables such as spinach and beets and for forage plants. One genus, *Atriplex*, commonly called Orache or Saltbush, furnishes abundant forage over most of the arid Southwest. The Indian too has made good use of Orache as a staple for his larder, grinding the seeds into a meal and boiling the salty young shoots and leaves for greens. The leaves also could be used for soap.

The tiny flowers are inconspicuous but the fruiting bushes fling sweeps of delicate color over great stretches of desert during many weeks of fall and early winter—lilac, mauve, lavender and rose. The shrubs often are so abundant as to dominate wide areas, blooming and fruiting prodigiously. Most of the species tolerate strongly alkaline or saline soil. The shrubs are compact and rounded in form, ashy-grey or almost white from the scurfy or mealy covering on the leaves and young stems, usually flowering in summer or early fall. The minute flowers cluster in the axils or form terminal spikes or panicles, the staminate and pistillate flowers on different plants. They have no corolla and the pistillate flower lacks even a calyx, being merely a pistil enclosed between two bracts, the staminate blossom having a 5-lobed calyx and 5 protruding stamens. Largest and showiest of the Saltbushes is

Atriplex lentiformis

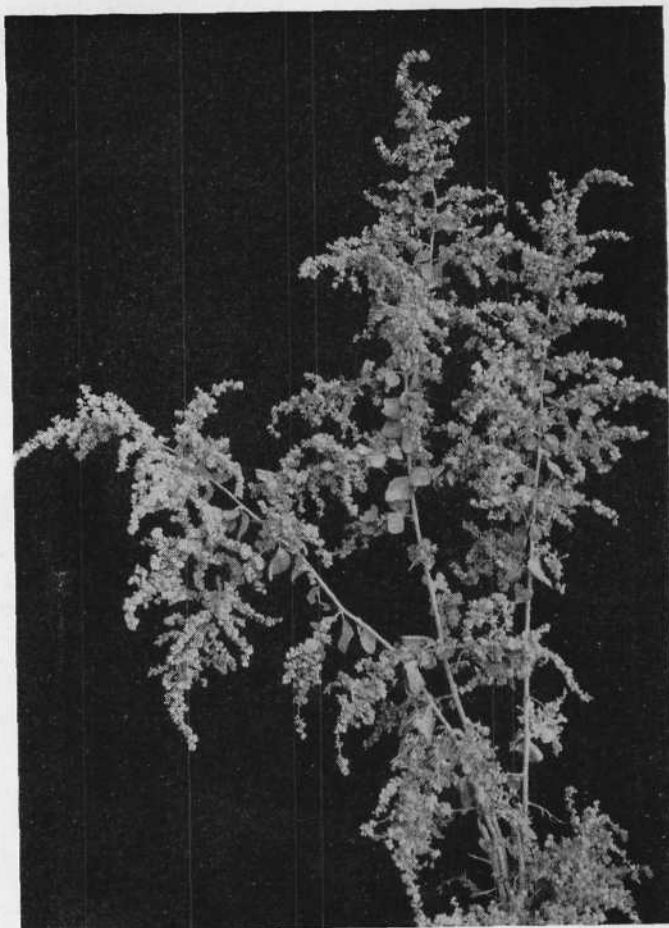
Quailbrush (its everyday name) is a large, intricately-branched, dome-shaped shrub 5 to 10 feet high and as broad or much broader, the scurfy herbage with a silvery sheen. Leaves are variable, ovate to elliptic with blunt apex and more or less undulate, up to 1½ inches long. The flower spikes are disposed in dense panicles 4 to 8 inches long, the tiny fruiting bracts enlarging to a width of ¼ inch, the pliant axis of the spike often curved or drooping. In the fall the bracts turn lavender or rosy-lilac, the bushes in the sunlight like iridescent domes, especially conspicuous on the silt flats about Salton sea and the adjoining sandy areas, also in low western and southwestern parts of Arizona. One of the species most favored by Indians for food, a valuable browse for livestock.

As a side line Quailbrush maintains an animal shelter, offering sanctuary to rabbits, roadrunners and all the Small Fry that scurry about the desert. Where it abounds there is no housing shortage for the large flocks of Gambel quail that pitter-patter around that region. Range from southern Utah and Nevada through Arizona and California deserts to Mexico.

Atriplex canescens

Commonly called Wingscale, Fourwing Saltbush, Cenizo, Chamiza, or Shadscale, it probably has the widest distribution of the Saltbush shrubs and is one of the most valuable forage plants of arid regions. Important because of its great abundance as well as its high nutritive qualities. Its salty flavor, evergreen habit and unusual resistance to drought and cold make it good all-year browse, the leaves, stems, flowers and fruits all being relished by livestock. The Indians not only used the seeds for meal but concocted a remedy for ant bites from the roots and blossoms ground into a powder to be made into a paste with saliva.

Typical roundish Saltbush form, hoary-grey, 1 to 5 feet tall, rarely twice that, the main woody stems rigid and somewhat



Fruiting panicles of Quailbrush. The dome-shaped shrub is sanctuary to Gambel quail, rabbits, roadrunners and many Small Fry of the desert. Photo by the author.

brittle, the whitish scurfy twigs bearing narrow, often clustered leaves, linear or spatulate, an inch or two long, finely scurfy-hairy. The small flowers appear in lavish profusion from June to August, the staminate in noticeable, spike-like panicles, elongated but dense, the pistillate in axillary clusters, insignificant at first but very conspicuous in fruit, each twin bract developing 2 broad roundish wings about ½ inch long, the margin irregularly incised or fringed.

Adaptable to varied conditions of soil and climate, its range extends from Great Basin area to northern Mexico, from western Texas to California deserts, from very low altitudes up to 6500 feet. Prefers deep sandy soil but may be found on gravelly mesas, washes and slopes. Common on sandy or saline flats and washes throughout Arizona, Colorado and Mojave deserts, exceedingly abundant in Colorado desert, where in October the sandy reaches of the Indio-Palm Springs region are fairly illuminated by the amazingly dense masses of bright light-green fruits, as striking as a flower display.

Atriplex confertifolia

Known as Shadscale, Sheepfat, and Spiny Saltbush, this too is a very important browse species. The spiny, compact, woody bushes are usually a foot or two high, occasionally 3 feet or more, growing typically in clumps of bushes, forming hummocks several feet in diameter, or as lone bushes. The rather stout woody stems are stiff, ending in spiny points. The grey scurfy leaves are ovate, broadly oval, or elliptic, the tip rounded, less than an inch in length, growing in rather crowded clusters along the branches. The flowers are arranged in spike-like panicles near ends of branches, the broadly oval bracts of the pistillate flowers enlarging as the fruit ripens to a length of ½ or ¾ inch.

It ranges from Utah and Nevada to Mojave desert, through Arizona to northern Mexico, being predominant in Utah and

Nevada, and in some parts of northern Arizona has crowded out nearly everything else. Typical habitat being dry plains and hill-sides, it frequently is abundant along borders of alkaline dry lakes, following up the washes and slopes of the surrounding mountains, up to 6000 feet.

Atriplex polycarpa

Cattle Spinach is the popular name but it has no resemblance to the garden vegetable other than its high nutritive value. It follows the *Atriplex* fashion of compact symmetrical form (2 to 4 feet high) and pale grey coloring, its most noticeable characteristic being the very small thick leaves crowding the branchlets.

A highly important forage plant, very abundant on river bottoms and benches, sandy-gravelly plains and low hills of Arizona, Colorado and Mojave deserts, southern Nevada and Lower California.

Atriplex hymenelytra

This distinctive Saltbush, widely known as Desert Holly or Silver Holly, was featured in the second issue of Desert Magazine (December, 1937) but we can't overlook this decorative member of the clan which not so many years ago was so exploited for Christmas decorations that it was threatened with extinction. Seldom more than 2 feet high, with a gnarly woody base and many stiff branches liberally supplied with thick, wavy-margined leaves, silvery white, coarsely, irregularly and deeply toothed, the stems and leaves so densely clothed with a fine white scurf as to appear spectral, except when ample rains give it a greenish tinge or tint its young shoots mauve or lilac.

The minute flowers appear in late winter, the axillary pistillate spikes more decorative in the bud stage before the stamens show their polleny heads. Then they often are miscalled berries, because of the purplish-red translucence that veils the closed calyx, like tiny crowded red dewdrops under a lens.

Stony hillsides, gravelly washes, canyons and mesas from Nevada through Mojave and Colorado deserts to western Arizona.

MERRIAM'S PLANT LIFE ZONES . . .

Traveling in the desert, it is noticeable that certain combinations of plants occur in various regions, almost as if they were members of a tribe determined not to become separated. Usually they are all at about the same altitude although not invariably so. In order to speak of such characteristic groups of plant "affinities" botanists have used various classifications. One which is especially helpful in the Southwest is the Plant Life Zone areas devised by Dr. C. Hart Merriam. Basis of his classification is a combination of rainfall, humidity and temperature; latitude, longitude and altitude; distance from ocean, local topographic features. Thus one life zone is not necessarily a broad, well-defined band to be drawn on a map, but may be broken up and at times form an isolated "island" in the midst of totally different life zones, as in the case of desert mountain peaks. At times the zones may be quite distinct, as on San Jacinto mountain. At other places the division is more gradual and indistinct. Sometimes a species which is the predominant one in one zone may extend into two or more zones. But on the whole, plants in each zone are characteristic of that zone and have many features in common; even the animal life may be somewhat similar.

Dr. Merriam named seven zones. (The altitudes given are necessarily arbitrary as there is much overlapping, depending upon the other factors involved.) They are: Lower Sonoran—below sea level to about 3000 feet; Upper Sonoran—about 1000 to 5000; Transition—2000 to 5000; Canadian and Hudsonian—5000 to 9000; Boreal (true alpine)—9000 to 14,500.

Lower Sonoran zone comprises most of the Colorado and Mojave deserts. In order to survive the typical conditions here—low humidity, annual rainfall from 0 to 5 inches, summer temperatures from 90 to 130 degrees, extreme temperature ranges and strong drying winds—they must be equipped to conserve water and limit evaporation. In other words, as Jerry Lauder-milk and Philip Munz showed in July, 1944, issue of Desert Magazine, they have to be "tough."

TRUE OR FALSE . . .

Review lesson this month reveals wide scope of subjects published in Desert Magazine. There are questions on physics, geology, gem cutting, mineralogy, history, botany, geography, Indians. To answer half of them correctly marks you a Desert Rat. More than ten right entitles you to degree of S.D.S. (Sand Dune Sage). Answers on page 34.

- 1—Palm Springs, California, is located on Highway 99.
True..... False.....
- 2—Lt. A. W. Whipple's 1853-4 expedition into the Southwest was for the purpose of establishing military posts. True..... False.....
- 3—Quartz always occurs in crystalline form.
True..... False.....
- 4—Jojoba sometimes has been used, especially by Southwest Mexicans, as a coffee substitute.
True..... False.....
- 5—Setting for Inter-Tribal Indian ceremonial held annually in August is Santa Fe, New Mexico.
True..... False.....
- 6—Grand Canyon at some points is 12 miles wide.
True..... False.....
- 7—Piñon nuts grow on a shrub in low elevations of the desert. True..... False.....
- 8—Perpetual ice cave in lava beds of western New Mexico has been known to the public but 30 years.
True..... False.....
- 9—Fremont Island is in Lake Mead. True..... False.....
- 10—Genuine jade is found in Wyoming.
True..... False.....
- 11—Most of Arizona, scientists believe, once was connected with the North Atlantic area by a seaway.
True..... False.....
- 12—Guayule rubber project, under which about 32,000 acres of guayule plants are growing in California, Texas, Arizona and New Mexico, was discontinued by congress in June. True..... False.....
- 13—Another name for halite is salt. True..... False.....
- 14—Generally a gem cutter prefers aluminum oxide to tin oxide as his polishing agent.
True..... False.....
- 15—Mormon Tea is known to botanists as Ephedra.
True..... False.....
- 16—Chulu is a large bird found in the mountains of southern Arizona. True..... False.....
- 17—In the dumps around a gold mine one would be likely to see chrysocolla. True..... False.....
- 18—Most desert shrubs are deciduous.
True..... False.....
- 19—White light is a combination of all colors.
True..... False.....
- 20—Tobacco was first introduced to desert Indians by early American traders and trappers.
True..... False.....

HERE AND THERE...on the Desert

ARIZONA

Extinct Volcano "Erupts" . . .

FLAGSTAFF—Jungle of trees and grass inside Howard crater, extinct volcano, was struck by lightning and blazed into fierce flames resembling an eruption last month. Imagining ashes and lava flow, Ranger Ed Oldham and crew fought and extinguished the blaze that destroyed 20 acres of forest within cone.

Officer Dies on Desert . . .

KINGMAN—Captain Howard Brady died of thirst and heat exhaustion on desert near here July 4 before local officers and civilian pilots could bring aid. Brady was enroute to auxiliary army field from gunnery school and became lost on side road.

Mexican Air Line Planned . . .

AJO—Aereo Transport company of Sonora, Mexico, completed surveys for new airline connecting Hermosillo with Tijuana with stops at Caborca, Sonoyta, San Luis and Mexicali. Company incorporated at \$27,000 will begin work on line as soon as sufficient stock has been sold in Sonoyta area.

Dam Project Surveyed . . .

KINGMAN—Bridge Canyon dam and companion project to bring Colorado river water into central Arizona would cost over \$500,000,000 and employ possibly 18,700 men for 72 months, according to survey by H. W. Bashore, U. S. reclamation commissioner. Storing 1,000,000 acre-feet of water and producing 1,000,000 horsepower of electricity this project would irrigate about 300,000 acres of new land and provide supplemental water for 300,000 already under cultivation.

Pow-Wow Successful . . .

FLAGSTAFF — Although expenses were greater this year than before, satisfactory profits were made at 16th annual All-Indian Pow-Wow and rodeo, July 2 and 4. It was most successful two-day show in history of the enterprise.

Plan for Abandoned Land . . .

YUMA—Resolution passed by county board of supervisors would sell to Gila Valley power district some 22,602 acres of land, reverted to county by tax default, for \$5,650.50. Efforts long have been made to save this area in Wellton, Roll, Mohawk valleys from total abandonment and great loss to the state.

Wolves Kill Cattle . . .

PHOENIX—Wolves crossing Mexican border into Willcox, Tucson and Nogales areas have been killing large numbers of cattle. E. M. Mercer, state fish and wildlife service agent, stated that survey is being made to determine if additional trappers are needed to augment men now employed in ridding Arizona of animals.

Paul L. Beaubien has replaced Clair V. Cook as custodian at Saguaro national monument, Cook becoming custodian at Chiricahua national monument, southeastern Arizona. George Baxter will succeed Beaubien at his former station at Walnut Canyon national monument.

Mrs. Sallie Pierce Brewer is now an official park ranger, stationed in Tumacacori national monument.

Dr. C. G. Salsbury, Ganado, was elected president of Association of Western Hospitals at meeting in San Francisco July 5.

Beautiful Pictorial Guides

Take your friends on a trip, unrestricted by rationing, into the enchanting regions of the Southwest. Journey deep into these lands through photograph-filled books, exploring ancient cultures, enjoying the vivid landscapes, getting the "feel" of the beauty and drama of old civilizations. What gift could be more welcome these stay-at-home days than a make-believe trip?

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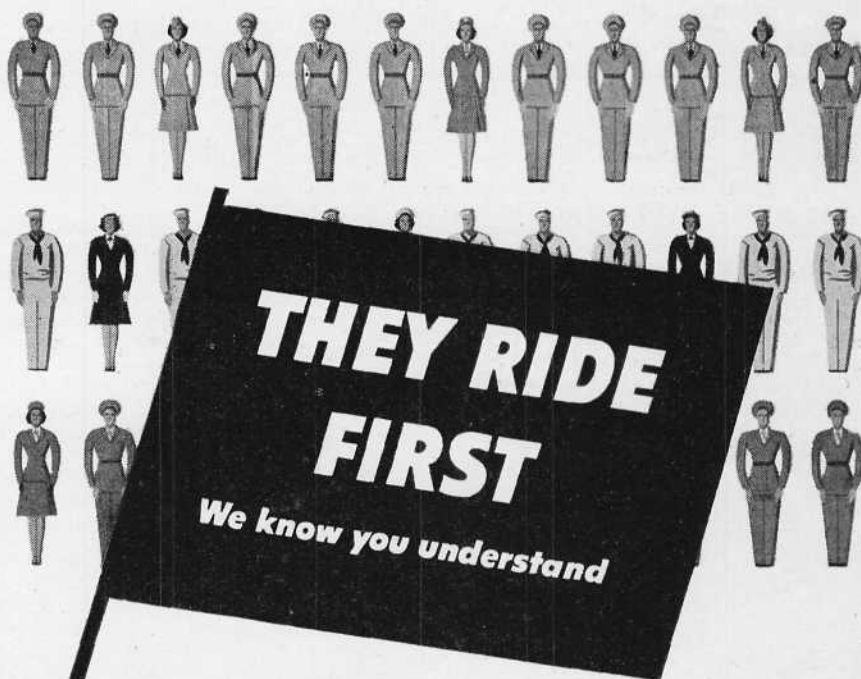
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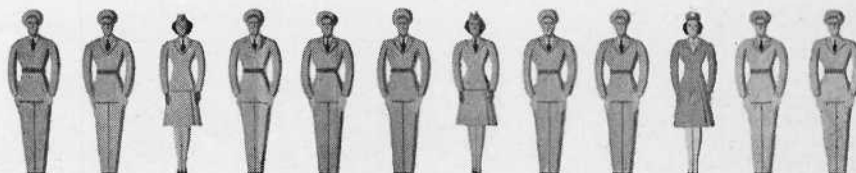
DESERT CRAFTS SHOP

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CALIFORNIA

New Naval Station . . .

TWENTYNINE PALMS—New naval base under command of Rear Admiral Elliot Buckmaster, USN, to be operated under San Diego naval air center, will be established at local air field, 11th naval district announced. This area has major advantage of little rain and all-year flying.

Mexico Granted Water . . .

EL CENTRO—Authority to release water from All-American canal to irrigate 160,000 acres of cotton in Mexico was granted by Secretaries Hull and Ickes in response to telegram sent them by Evan T. Hewes, chairman Imperial Irrigation district. Water was to be served only during emergency and negotiations were undertaken with Mexican government for payment.

Wonder Drug Provides New Market

EL CENTRO—Penicillin, by requiring 5,000,000 pounds of powdered milk a year in its production, will open up new post-war markets for Imperial Valley dairymen, as well as others throughout the country, according to George Winright, assistant county farm adviser. Entire national consumption of powdered milk heretofore was but 7,000,000, and increased amount now necessary in penicillin should help bring about increased farm prosperity.

Rare Sheep Killed . . .

BLYTHE—Big horn or mountain sheep was found shot near Vidal highway July 19 by Jimmy Hill, cattleman. These sheep are virtually extinct, an estimated 50 being in the entire state of California. Stiff penalties are imposed in state and federal game laws for illegal killing of animals.

Naturalist Passes . . .

BANNING — Marshall French Gilman, nationally known scientist, died at his home here July 18, aged 73. Gilman's research led to discovery of many desert plants, some named for him. He worked also in propagating and cultivating drug plant ephedra. For several years until he retired from government service at age of 70, he was acting custodian of Death Valley national monument, establishing a nursery and botanical garden of native plants there.

Yucca Survey Made . . .

INDIO—Dr. J. M. Webber and his father Dr. H. J. Webber recently have completed a month's tour and survey of desert areas in Arizona, New Mexico and Southern California to determine extent of yucca growth as a source of coarse fiber. In collaboration with USDA, they have secured data on distribution and method of regeneration of plant, cost of growth, harvesting and land.

Swimming Pool Iced . . .

PALM SPRINGS—When desert heat permeated even swimming pool at hotel here, resourceful Co-Manager Irene Foldes dumped 300 pounds of ice into the water to cool it. But by the time photographer to record scene arrived, the ice had melted.

NEVADA

Game Refuge Surveyed . . .

WINNEMUCCA—Survey by members of forest service in Santa Rosa game refuge revealed that area is fully stocked with over 3,000 deer and forage is better than usual. It was recommended that number of deer be maintained at this figure so sufficient feed for animals in refuge would be available.

Basque Sheepmen Arrive . . .

WINNEMUCCA—Eighteen Basques from northern Spain arrived here July 25 to become sheepherders in Humboldt, Elko counties and in Idaho. Herders are hired on temporary basis, permits to remain in U. S. expiring in a few months. It is believed that blanket permits for extension of stay will be applied for before expiration date.

Park Areas Receive Funds . . .

BOULDER CITY—Recent federal appropriation for national park service funds included allotment of \$74,500 for Boulder Dam national recreation area, \$5019 for Lehman Caves national monument.

Plan for Topographic Map . . .

WINNEMUCCA—S. T. Tudor and C. N. Mortenson of U. S. department of interior have begun control surveys for topographical map of approximately 480 square miles in Little Humboldt river area between Golconda and Paradise Valley. Such a map long has been in demand by many engineers and geologists. Maps are expected to be available latter part of 1944 or early in 1945.

NEW MEXICO

Zuñi Turtleland Dry . . .

GALLUP—Because of exceptional dryness this year, Zuñi Indians returned without turtles from their traditional pilgrimage into mountains preceding Shalako ceremony. Rain dances were begun to relieve water shortage which caused Black-rock reservoir to fall to very low levels, Shalako proceeded without participation of turtles.

Wants Navajo Bride . . .

WAGON MOUND—Aged Mexican sheepman wrote Navajo agency requesting a young Indian bride to help him tend sheep and goats on his 1600-acre ranch near here. He stated he would prefer she brought her family too, and he would buy a loom for her parents to weave rugs.

The Desert Trading Post

*Classified advertising in this section costs five cents a word, \$1.00 minimum per issue—
Actually about 1½ cents per thousand readers.*

MISCELLANEOUS

For Sale: Complete Lapidary Shop, with five motors, show cases, many minerals and gem materials. Call Sundays from 9 a.m. to 6 p.m. H. Cotterman, 5118 Granada St., Los Angeles 42, Calif., in Highland Park.

FOR SALE—Indian relics, 23 assortments from which to choose, \$1.00 per assortment or \$20 for all 23. All perfect specimens. Choose from these: 10 beautiful prehistoric Indian arrowheads; 10 tiny bird arrowheads; 10 arrowheads from 10 different states; 2 stone tomahawks; 4 spearheads; 5 stone net sinkers; 10 fish scalers; 2 hoes; 4 agate bird arrows; 5 flint drills; 7 flint awls; 10 beautiful round head stunning arrowheads; 4 fine sawedged arrowheads; 4 fine flying bird arrowheads; 4 fine drill pointed arrowheads; 4 fine queer shaped arrowheads; 4 rare double notched above a barbed base arrowheads; 5 double notched above a stemmed base arrowheads; 12 small knife blades of flint; 1 rare shaped ceremonial flint; 3 flint chisels; 7 crystals from graves; 10 arrowheads of 10 different materials including petrified wood. Locations given. 100 arrowheads \$3.00. 100 very fine mixed arrowheads all perfect showy colors including many rare shapes such as drill pointed, double notched, saw edged, queer shapes, etc., location and name given, \$25.00. List free. Lears, Glenwood, Ark.

Large stock of petrified palm. Twenty tons of rock specimens. Navajo rugs, reservation hand hammered silver and baskets from many tribes. Many other handmade artifacts. Daniels Indian Trading Post, 401 West Foot-hill Blvd., Fontana, Calif.

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Dancers Ride Donkeys . . .

GALLUP—"If we don't get any gas we can hire a few donkeys!" Jemez Indian Pueblo Governor Cristino C. Panana reported in letter to M. L. Woodard, secretary of Indian Ceremonial association. Governor indicated that his dance team was ready for big reunion in Gallup in August and would arrive on time even if they had to hire donkeys for transportation.

To Restore Wildlife . . .

SANTA FE—Heading field party of specialists from Wildlife service and Texas A. & M. college who surveyed resources of 707,895-acre Big Bend park in southwest Texas, Dr. Walter P. Taylor stated that half century will be required to restore wildlife in the area. Grazing, hunting and other adverse uses in park must be ended before nature can heal the scars, he declared. Park opened July 1.

Indians to Purchase Lands . . .

GALLUP—At current meeting of Navajo tribal council, expenditure of \$1,100,000 for purchase of lands outside reservation to relieve congestion was urged by members. Provision included that such lands shall remain on tax rolls and be self-supporting through payment of fees by Indians to whom allotments are made.

Carlsbad Caverns attracted 10,968 visitors during the month of May, more than any other national park, national park service declared.

Allotment of \$663,019 has been granted for protection of national parks, monuments and recreational areas in seven western states, M. R. Tillotson, regional director announced.

Irving D. Townsend, chief ranger at Hot Springs national park, Arkansas, has been promoted to custodian of Aztec ruins national monument, New Mexico.

UTAH

Hovenweep to Be Guarded . . .

SALT LAKE CITY—Jesse L. Nussbaum, new superintendent of Mesa Verde national park, Colorado, plans to send workers to reinforce five major groups of Hovenweep, 1300-year-old dwellings erected by cliff dwellers, so they will remain intact and not lose original planning and construction. Postwar plans for construction of modern highway to monument are being formulated.

Postwar Projects Planned . . .

SALT LAKE CITY—Reclamation bureau's postwar program contemplates construction of 18 projects in Utah, including completion of Deer Creek, at estimated cost of \$164,679,000. Of 18 projects, three of which concern power and flood control, only at Deer creek can work begin immediately. Others are still under study.

DESERT TRAVELOGS

Noteworthy scenic spots have been described in the "Mojave Desert Travelog." Ghost Towns, Crimson Canyons, Historic Mines, Rocks and Semi-Precious Stones, Desert Wildflowers, Ancient Indian writings are interestingly written, profusely illustrated with photographs and detail maps. Set of 12 travelogs, price 25c. Write to Barstow Printer-Review, Barstow, California.

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THE *Desert* MAGAZINE

636 State St. El Centro, California

Mines and Mining . .

San Diego, California . . .

Investigation of deposits of Iceland spar, used in bomb sights and other precision instruments, was concluded in July by Cordell Durwell, geologist, and Charles H. Reed, secretary-treasurer of bureau of mines of San Diego county. Numerous deposits were found in eastern section of Borrego valley area.

Salt Lake City, Utah . . .

Increased demand for celestite in manufacture of tracer bullets and signal flares, and oil well drilling swelled domestic production from 4041 tons in 1943 to 7566 tons in 1944. Peacetime prospect for domestic celestite however is not encouraging because of competition with English and South American producers, according to bureau of mines.

Reno, Nevada . . .

Grant H. Smith, veteran mining attorney and author of recent book, "History of the Comstock Lode," died in July in a coast hospital. Smith left his voluminous accumulation of data on the Comstock district to Mackay School of Mines, University of Nevada.

Indio, California . . .

High grade gallium sample found in Coachella valley has been donated to Massachusetts Institute of Technology by Clyde Hall who found rare ore on his property. Gallium has peculiar property of melting at body temperature and will have innumerable uses as soon as quantity production of extracting metal from ore is found.

Bishop, California . . .

Regular July monthly meeting of Western Mining council held in Bishop formed resolution to by-pass President Roosevelt's power to raise price of gold to \$41.67 and asked congress to set price at \$70.00. Blaming present war costs of labor and material, taxes and governmental regulation, various speakers maintained congress should take action to set desired price.

Winnemucca, Nevada . . .

Four large muscovite, common form of mica, claims have been located in southern Pershing county by Paul G. Reed, Ira Stanley and Walter Fitzgerald. Samples have been sent to U. S. bureau of mines to determine value of material.

Winnemucca, Nevada . . .

Under special lend-lease agreement, United States will ship 100,000,000 of silver to India to provide coins for currency needs of allied troops there and to restrict inflationary rise in prices, strengthening the rupee. News of silver agreement caused fall of nearly five rupees in price of silver because of fear of reprisals against hoarders and speculators who had bid up prices, detrimental to the rupee.

Kingman, Arizona . . .

Bill introduced into congress by California representative Clair Engle if enacted will permit loaning of federal funds to open up and rehabilitate gold mines now closed under Order L-208. Reconstruction

San Francisco, California . . .

Bulletin No. 126, containing 224 pages and 7 illustrations, is just off press and ready for sale from divisional offices in San Francisco, Sacramento and Los Angeles, state mineralogist Walter W. Bradley has announced. One of series of annual statistical reports, it contains detailed data on amount and value of metallic and non-metallic minerals, properties and uses of over 60 mineral substances, supplemented with compendium of information on commercial minerals of California and directory of all producers. Price 75 cents, State Mineralogist, San Francisco 11, California.

UNITED WE STAND In Opposing Ratification of Water Treaty with Mexico...BECAUSE...

- The treaty abrogates the Boulder Canyon Project Act which declares that flood waters conserved by Boulder Dam shall be used "exclusively within the United States."
- Boulder Dam was built entirely on American soil by American initiative, engineering genius and money.
- The United States has solemnly contracted with American communities and states to deliver them quantities of Boulder Dam water and power, which are indispensable to their development.
- Relying on the Project Act and those contracts, American citizens have committed themselves to pay hundreds of millions of dollars for construction of works with which to use their Boulder Dam water and power.

- AMERICAN COMMUNITIES, not the United States, are, under their contracts, standing the entire cost of the Boulder Dam.
- During cycles of dry years, such as have regularly occurred, and will recur, American uses of water would have to be curtailed to supply Mexican lands.
- The Treaty "guarantees" Mexico, for all time 1,500,000 acre feet per annum of Colorado River water—twice what Mexico had ever used prior to construction of Boulder Dam—twice what Mexico could possibly use without Boulder Dam.
- International Good-Will does not require, nor justify sacrifice of the natural, irreplaceable resources of the United States.

IF AMERICAN CITIZENS FAIL TO MAINTAIN THEIR FREEDOM, WITH ITS RIGHTS AND PRIVILEGES ON THE HOME FRONT—VICTORY OVER THE AXIS AGGRESSORS WILL HAVE BEEN IN VAIN!

Imperial Irrigation District



GEMS AND MINERALS

ARTHUR L. EATON, Editor

MINES JOURNAL MAPS CALIFORNIA MINERALS

July issue of California journal of mines and geology contains map showing approximate location of California deposits of gas, oil, chromite, copper, gold, iron, manganese, quicksilver, silver, tungsten, zinc, lead, andalusite, kyanite, barite, sandstone, granite, slate, clay, diatomite, gems, gypsum, iodine, limestone, cement, marble, magnesite, mica, pumice, salines, soapstone, sulphur, talc and wollastonite. These booklets of the state division of mines each contain about 125 pages of materials on California minerals and mines.

IDENTIFYING DIAMONDS

Cut and polished diamonds are familiar sights all over America, in rings, pins, brooches, as well as in the windows of every jewelry store and pawn shop of the country, but uncut stones are unfamiliar to the general public, and almost as unfamiliar to all jewelers, dealers, and even to most gem cutters. Only a few diamond cutters, equipped to handle them, have ever seen many of the uncut stones.

Diamond crystals are not uncommon. They occur wherever diamonds are found. The most common crystal is the octahedron, or dodecahedron, but well formed cubes are not unknown in certain localities. A few minerals have curved surfaces, most notable among them the diamond and ruby. When the amateur finds a crystal with a curved surface, he finds it confusing to identify the exact type of crystal in his hands.

The diamond crystal has other characteristics which often help to identify it. Despite their great hardness, crystals found in the western hemisphere are almost always somewhat water-worn. A crystal surface often shows distinct triangular markings, sometimes in the form of a depression or bump. A few crystals show small but sharp triangular points. The well known rainbow colors seldom or never show themselves except in cut stones.

Diamonds are harder than any other stone, but this means little to the amateur. The public has been educated to believe that any stone "as hard as flint," or one that will scratch glass is very hard. Glass has a hardness of about six and flint, seven, the usual hardness of all quartz minerals, while a diamond is classed as ten, although it is many times as hard as a sapphire. Any medium hard stone will scratch glass, but that is no test. A sapphire crystal is hardness nine, far harder than quartz or flint. Only the diamond will make a distinct mark on it, although one sapphire will make a faint mark on another.

Among the stones mistaken for diamond, the commonest is broken crystal quartz, which shows rainbow colors at times; also, beryl, topaz, and even such soft stones as fluorite or scalenohedrons of calcite. Anyone wishing to prospect for diamonds should familiarize himself with the crystals by spending two or three dollars for small, off-color specimens. He also should provide himself with two or three sapphire specimens from some reliable dealer, for purposes of hardness tests.

SAN FERNANDO CLUB HOLDS GEM AUCTION

San Fernando Valley mineral and gem society held its annual dinner and auction July 9 at Valley Vista woman's club, North Hollywood. Fried chicken and rabbit dinner was served at 1:30, followed by the regular meeting.

President Cash Ferguson introduced 20 guests, including L. Lehman, president of Los Angeles mineral society, and his wife. Mr. Ferguson, acting as auctioneer, opened auction by selling a specimen of septeria to Jo Iverson. More than 200 specimens were sold. Outstanding bid was made by Randolph Peyton. Don Graham assisted as auctioneer. C. W. Clark, assisted by Mrs. Cash Ferguson, acted as clerk.

THE WAR WORKER'S HOBBY

By CHARLES G. SCHWEITZER
Los Angeles, California

My day's work is finished, I've given my best;
It's time to go home for refreshment and rest.
And after my dinner, I'm now at my ease,
So I go to my workshop to do what I please.
The cares of the world now all pass away,
My grinding the stone is just pleasant play.
By day I grind gadgets, the foemen to wreck;
At night I grind pendants, the lady to deck.
By day I breathe hatred for foe as I grind,
At night in my workshop I'm at peace with mankind.

I work with a will, and soon is revealed
The beauty in stones which the Maker concealed.
The hours pass quickly as wheels grind and spin,
And then a sweet voice calls, "It's time to come in."

Though tired in body, at peace is my mind;
A restful night's sleep prepares the day's grind.



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CUTTER'S ASSORTMENT. For \$1 we will send you a 3 lb. assortment of the following rough gem materials: Rhodochrosite, Variscite, Thunder Eggs, Eden Valley Wood Limb, Montana Moss Agate, Brazilian Agate, California Blue Agate, Turritella Agate, Petrified Wood and etc.

PETRIFIED WOOD—Washington. Asst. Varieties. 50c lb. Special 10 lb. asst. \$3. Slabs 15-25c per sq. in.

On all orders for gem material add 20% to cover Federal Luxury Tax. Residents of California be sure to add the 2 1/2% Calif. State Sales Tax.

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Northern California mineral society, at June meeting, added many new members, including May and Ida Williams, Mrs. S. A. Fryer, Bert Walker, C. L. Smith, chief warrant officer USN, Capt. C. T. Sena, Capt. Franklin R. Schwoob, medical corps USA, all of San Francisco, and R. E. Jeffrey of Inola, California. Speaker was R. E. Lamberson of Oakland, who related his prospecting experiences through Panamint range and Death Valley about 1905.

San Diego mineralogical society held the first meeting in their new quarters, auditorium of YMCA, Eighth and "C" streets, June 11. Harold W. B. Baker described his travels and explorations in Alaska. He told also of the mines, geology, terrain and climatic conditions of various parts of Alaska. New secretary is Mrs. Catherine Cheatham, 4120 Utah street, San Diego 4, California. She succeeds Mrs. Paul E. Wedgewood, who recently moved to San Bernardino. Robert W. Rowland is president.

Charles G. Schweitzer, editor and librarian of Los Angeles lapidary society, announces the following officers were elected for the coming year: R. E. Willis, president; Claude B. Rosenberg, first vice-president; H. Loren Mitchell, second vice-president; Mrs. Goldie Wood, secretary; Melvin E. Gaider, treasurer; Leland Quick, historian. Committee chairmen appointed by the president are: Thomas Warren, constitution and bylaws; Mrs. Belle Rugg, hospitality; Ted Schroeder, mineral sales; Mrs. Charles Ewing, gem display; Ben Maben, field trips; Charles G. Schweitzer, editor and librarian.

James W. Wallace, manufacturing jeweler and lapidarist, spoke on gemstone polishing for the amateur at July meeting of San Diego mineralogical society. He discussed both equipment and methods for the amateur gem cutter.

Los Angeles mineralogical society studied magnesium at their July 20 dinner meeting. William R. Harriman talked on magnesium and Richard F. Lehman on the chemical features of its recovery from sea water before showing the bureau of mines sound film depicting recovery of magnesium from ocean water. Annual auction netted the society 80 dollars made by sale of specimens donated by members. July field trip was a visit to state and county mineral exhibits at Exposition park. A lively swap fest preceded luncheon. Everyone was requested to bring at least one rock to trade.

Fifty-one members and friends of Orange Belt mineralogical society met July 16 at Perris hill park, San Bernardino, for a covered dish dinner. Mrs. D. H. Clark described a trip through Idaho for geodes and petrified wood. J. C. Filer prepared a grab bag which the members enjoyed.

Mrs. Nettie Welch, Alameda, held open house July 9 for members of Northern California mineral society. She provided trading material for those interested. Bob Deiderick of Oakland was July 19 speaker. He discussed mineral localities of California, many of which he has visited. Mineral specimens illustrated his talk. Lapidary class, under F. J. Sperisen, is proving an interesting and absorbing pastime.

Various types of jasper were the subject for June meeting of Golden Empire mineral society, which met with President Owens. Members had fine exhibit of uncut, cut and polished specimens. Door prize was specimen of Glenn county jasper, and a piece of Morgan Hill jasper was given winner of the mineral naming contest. Northern California, Washington and Oregon boast some of the finest jaspers in the world, and there is much interest in collecting it.

Marquette geologists association, of Chicago, Illinois, is one of the coming societies of the country, to judge by their new and enlarged bulletin. The 1944 officers are Stevens T. Norvell, president; John Reese, vice-chairman; Margery Scanlon, secretary-treasurer; Thomas Scanlon, membership; Mrs. Val Rutkowski, program; and H. Richardson, curator-librarian. Future plans include new bulletins, interesting programs and as many field trips and picnics as possible. Mrs. Bernice Platte and Mrs. Florence Richardson are co-editors of the bulletin.

Eighty-five members of Los Angeles lapidary society enjoyed a potluck luncheon and rock trading bee at the home of Mr. and Mrs. S. P. Hansen, in Eagle Rock district. Mr. Hansen's collection of cut and polished stones was on display. Ben Maben, in charge of arrangements, plans other novel "field trips."

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15 specimens, all different, of Colorado minerals, size 2x2 \$10.00. Included free are 10 lizard scales, prehistoric. Jack O'Brien, P. O. Box 886, Carbondale, Colorado.

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Minerals, Fossils, Gems, Stamps, Coins, Pistols, Glass, Bills, Indian Relics, Bead Work. Catalogue 5c. Cowboy Lemley Curio Store, Las Cruces, New Mexico.

INDIAN RELICS, Curios, Coins, Minerals, Books, Old Buttons, Old Glass, Old West Photos, Weapons, Catalog 5c. Lemley Antique Store, Osborne, Kansas.

Closing Out: Beach Moonstones, Agate, Jasper, Mint Canyon Agate. 15c lb. Come after it. White, 410 N. Broadway, Redondo Beach, California.

Agate Chips, require no sawing, one pound assortment 75c. Small slabbed pieces 1/2 inch and up one ounce 30c, 1/4 pound \$1.00. ESCALANTE AGATE COMPANY, Box 941, Grand Junction, Colorado.

Jewelry stones removed from rings, etc. 100 assorted \$2.40. B. Lowe, Box 311, St. Louis 1, Missouri.

INTRODUCTORY OFFER—One dollar each lot. Five all different Fluorescent Agates—polished. Thirty rough Mexican Opals. Fifty nice pieces Turquoise. Twenty different polishing specimens. Postage ten cents. Minerals and gems on approval. DR. RALPH MUELLER, Professional Building, Kansas City, Missouri.

Montana Moss Agates in the rough for gem cutting, \$1.00 per lb. plus postage. Elliott's Gem Shop, 26 Jergins Arcade, Long Beach 2, Calif.

\$2.50 brings you prepaid six rare and beautiful crystallized Arizona minerals. Vanadinite, Diopside, Wulfenite, Willemite, Chrysocolla, Azurite. Specimens 1 1/2 x 2 or larger. Wiener Mineral Co., Box 509, Tucson, Arizona.

Choice Palm Root—Full of eyes showing root and trunk structure. Very colorful. Sliced for Cabochons. 25 cents per square inch. Satisfaction guaranteed. GASKILL, 400 North Muscatel, San Gabriel, Calif.

50 ring stones, including genuine and synthetic—\$7.50. 12 genuine Opals or Cameos—\$2.75. Plus 20% tax. B. Lowe, Box 311, St. Louis 1, Mo.

TRUE OR FALSE ANSWERS

Quiz on page 28.

- 1—False. Palm Springs is on Highway 111.
- 2—False. He surveyed rail route from Ft. Smith, Ark., to Pacific Coast along 35th parallel.
- 3—False. Quartz may be crystalline or amorphous, the latter without definite internal molecular structure.
- 4—True. Jojoba, or goatnut, when dried, ground and roasted makes palatable beverage.
- 5—False. Ceremonial is held in Gallup, New Mexico.
- 6—True. Grand Canyon width varies from about five to 12 miles.
- 7—False. They are from Piñon pine tree which grows on desert mountains.
- 8—False. Lummis found it in 1891 while bear hunting and described it in his book "Some Strange Corners of Our Country," published that year.
- 9—False. Fremont Island is in Great Salt Lake.
- 10—True. Good quality jade occurs in Lander county.
- 11—True. Pre-cambrian Ontario sea, a wide shallow strip of water, extended from Southern California, through much of the Southwest, northeasterly to Labrador—about 400 million years ago.
- 12—False. Project was extended for one year from June, 1944.
- 13—True.
- 14—False. One objection is that aluminum takes longer to get a good polish.
- 15—True.
- 16—False. Chulu, or coatimundi, is a relative of racoon, which has been migrating into southern Arizona from Mexico.
- 17—False. Blue or blue-green chrysocolla would be found at a copper mine. It is a copper silicate.
- 18—False. 19—True.
- 20—False. There are several native tobaccos. *Nicotiana attenuata* is one of the commonest.

Fresno meeting of Sequoia mineral society at Holmes playground in July was their largest gathering of the year according to Gates U. Burrell, president. The register showed 76 members, relatives and friends present. Several members who had been unable to attend Parlier meetings were present at Fresno. The speaker, Dr. McKim, his wife, and Mr. and Mrs. Crawford were presented cabochons. Not the least interesting part of the program was a bountiful potluck supper.

Searles Lake gem and mineral society held their regular July meeting at Wagon Wheel mine, property of Bill and Alice Lewis. July field trip was a visit to the home of Mr. and Mrs. V. L. Carr at Little lake. Those who did not mind the hot July sun visited Coso hot springs in search of obsidian, sulphur and cinabar.

Myron Everts, head of Arthur A. Everts Jewelry company, one of the Southwest's leading jewelers, was speaker at July 11 meeting of Texas mineral society, held in Baker hotel, Dallas. His subject was gem stones—genuine and synthetic. Mounted, unmounted and gem rough stones were exhibited by the speaker to illustrate his talk. Subject for August meeting was to be the color theory as applied to minerals, by George Kadel, instructor in graphic arts, Crozier technical high school, Dallas. Mr. Kadel is a member of national association of color research.

The regular July meeting of Sequoia mineral society was held July 4 in Dinuba city park, Dinuba, California. Prizes were furnished by members, each prize marked either lapidary or specimen on the outside. Drawings were held from the sturdy prize boxes which had been made by Ross Snyder.

Membership of Los Angeles lapidary society is limited to 200 members and has almost reached that number. Displays of stones and cut material at each of the 12 meetings of the year have replaced general annual exhibit. Also, each month has featured a field trip to the different parks, or a visit to homes of members.

Gem Collectors club, Seattle, Washington, held a picnic, July 9, at the Reachmond beach home of Mr. and Mrs. Jack Landon. Rocks were shown and discussed, the rock fireplace admired, and some members looked for agates on the beach. Another picnic was enjoyed August 6 at Kennear park, Seattle.

Long Beach mineralogical society held its regular meeting July 14, at Nine Hole club house, Long Beach. Member Roy Wagner, speaker, gave members a special treat when he demonstrated all those vague terms one reads about such as "bead test," "heat test," "streak and color test." Also some analytical tests were made.

Paul VanderEike, editor of Mineral notes and news, addressed Kern county mineral society at June meeting on subject of fluorescence. He explained "that matter is mostly space, and that when the electrons of the atoms are bombarded with ultra violet light waves they are momentarily shot out of their orbits. When these electrons return to their former position, the energy released is converted into visible light."

Lassen rocks and mineral society travelled to Gold Run, about six miles from Susanville, California, June 25. Ice cream and coffee were furnished free, but members brought their lunches. Earl Mason supplied prizes. Beautiful setting of Gold Run added much to the interest of the meeting.

Cogitations . . .

Of a Rockhound

By LOUISE EATON

This is the time of year that you begins to be glad that you still has a chance to get out on the desert. Gas 'n tires permitin'. About August you'd have sold the whole waste of sand 'n heat 'n bugs fer 15 cents Mexican money. But now nights 'r gettin' coolish, stars sparkles like dimons 'n yure nearly sick inside with longin' to get out into the peace of unpeopled places. Provided of course there's rocks handy in um!

Tacoma agate club was host to Seattle Gem Collectors club at Salt Water park, August 20.

June meeting of Marquette geologists association, Chicago, was given over to two pictures exhibited by Thomas Scanlon. One on the geology of petroleum, showed how oil deposits were formed millions of years ago, and how geologists locate the deposits today. The other picture, dealing with placer gold, depicted the methods of panning gold during the California gold rush of '49.

Mineralogical Society of Southern California held its annual dinner and exhibit June 11 at home of L. W. Giddings on East Colorado street. Dinner was followed by the meeting at which ribbons were awarded for general mineral collections, crystal groups, crystals, polished slabs and flats, cabochons, facet cut stones, spheres, trays, jewelry, fossils and rock types. Annual meeting of M.S.S.C. always features an auction. Members either donate specimens, or bring them to be sold on a 20 per cent basis. Committees were: Harold Hart, L. W. Giddings, exhibits; Morris R. Ebersole, K. N. Reed, L. W. Vance, H. G. Kirkpatrick, W. J. Perkin, Victoria Rodekohr, auction; Harry and Mrs. Gee, decorations; Dorothy Chamberlain, Lillie Rhorer, reception; D. B. Scott, S. Hill, E. W. Chapman, judges.

Selma lapidary class of Sequoia mineral society meets every Monday at 7 p. m. and lasts as late as may be desired. This is a change of hour from the one previously announced.

June meeting of Long Beach mineralogical society took the form of a potluck supper. Mrs. R. O. Patterson won the door prize, a large polished slab of Nevada wood. W. L. Mayhew spoke on eruptions of Mt. Lassen from personal experience. Society proudly announces they are now owners of two war bonds. Earl Sartwell exhibited a drill which he had made and allowed the members to make notes and sketches. A polished heart was given to Mrs. Potter, retiring refreshment chairman, and a fine cabochon to each of her assistants, Lucile and Mrs. Cutler. Jesse Hardman will be the new chairman, with Mrs. Patterson and Mrs. Sopher as her helpers.

New officers of Texas mineral society are: Dr. L. A. Nelson, president; C. L. Doss, secretary-treasurer; A. L. Jarvis, G. E. Shackelford, Dr. H. A. Trexler, T. D. Copeland, board of directors. Mr. Copeland is the retiring president.

An expected production of about three thousand tons of cobalt is reported from the mountains of Spain. The newly discovered deposit shows, on analysis, to have about 5.9 per cent cobalt.

GUIDE TO QUARTZ FAMILY

Quartz Family Minerals, by Dake, Fleener and Wilson, answers a long felt demand for definite knowledge of the stones, gems, and minerals of the quartz family. This book contains simple, definite descriptions which are easily understood by the amateur, and complete enough for the professional mineralogist. Some of the best sections deal with opal, agate, petrified wood, geodes, thunder eggs, sagenite, quartz crystals, amethyst, and cabochon and facet cutting. There seems to be no other book which deals exclusively with quartz minerals, or which handles, names and describes all of them as completely. 304 pages, \$2.50.

HOW THE GERMANS SAY IT

The Germans boast of their beautiful language. Here is a sample from "Die Edelsteine" of W. Rau, verlagsbuchhandlung, J. J. Weber, Leipzig:

Katzenauge—cat's eye; Smaragd—emerald; Blauer zircon—blue zircon; Bergkristall mit einschliessen—quartz with inclusions; Rauch-quartzkristall—smoky quartz crystal; Mexikanischer opal—Mexican opal.

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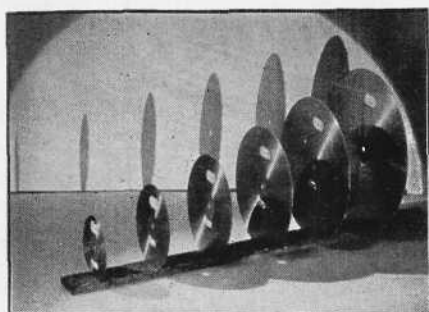
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AMATEUR GEM CUTTER

This page of Desert Magazine is for those who have, or aspire to have, their own gem cutting and polishing equipment. Leland Quick, who conducts this department, is former president of Los Angeles Lapidary society. He will be glad to answer questions in connection with your lapidary work. Queries should be addressed to Desert Magazine, El Centro, Calif.

By LELANDE QUICK

The end of the war looming on the horizon brings me letters from the desert expressing real alarm that its end will only mean the descending of jeeps with hordes of rockhounds on desert areas. So much vandalism has been practiced under gasoline rationing that our desert friends are having nightmares about what may happen when restrictions are lifted.

August Desert Magazine reports that in famous Boothill cemetery at Tombstone there are only four markers left that are legible and that names of passing tourists cover these. Most tombstones have been carried off as souvenirs. Visitors at old and well known gem locations report that the destruction of materials is appalling.

Probably the most harrassed individual is Mark Foster who operates the Rainbow Ridge opal mine and other properties in Virgin Valley, Nevada, the most remote place I could imagine under gasoline rationing. It seems that people can persuade ration boards that they are "ill and must go to the desert," then they travel hundreds of miles to Virgin Valley. One man arrived with 50 fruit lugs he confidently expected to fill with precious opal. Another party had Foster guide them about for three days for which they generously tipped him \$2.00. Bags of valuable quicksilver ore were taken from a prominent mine during the lunch hour by rockhounds who were combing the dumps.

It isn't only the amateurs—who may be pardonably ignorant—who commit these nuisances but as Foster says "a rockdealer wrote for permission to come in company with an honorable geologist. Then he began sneaking in with friends and carrying off the green fluorescent opal in pick-up loads. A state employee stole one of the loads and paid helpers 50 cents an hour to carry it in sacks to the road. A fence was cut for convenience and I got the blame." Foster left the valley for a while and double padlocked the mine. When he returned everything was destroyed and it took him 42 days to get re-organized. On the 4th of July this year, despite rationing, flocks of people evidently planned a Virgin Valley trip for they arrived in droves, ignored markers and began to raid the claims and tear up the dump car tracks. Virgin Valley is public domain but legitimate claims are private property and they are plainly posted. Foster's company has an investment of \$85,000 in their property and, as he says, "people don't invest that sum in a business to turn it into a picnic ground. If an investment of \$85,000 and years of mining failed to yield opals in paying quantities how do you expect to find opals on a short visit here?"

It is anyone's privilege to visit Virgin Valley of course. I intend to go there someday myself. But this is just one example of the unthinking public becoming pests and robbers and giving a black eye to all considerate rockhounds by disregard for private property. The same thing exists with relation to the beanfields at Nipomo in San Luis Obispo county, California. I predict that the public will become such pests there that every farmer in the area will have a gun loaded with buckshot handy for anyone who steps in a field. It is not the fault of published information about such places that causes trouble; it is just plain human nature. City folks would be horrified indeed if the desert folks descended on them some weekend, carried off the tombstones as souvenirs and broke into factories closed for the weekend to help themselves to cart loads of products. The people in the des-

erts are just as shocked and indignant at the vile behavior of some city visitors. In the postwar period we should all be cautious and courteous, sane and sensible, ladies and gentlemen when we visit the desert "wastes," a word too easily misunderstood and wilfully misinterpreted.

Dan Dunham of Omaha, Nebraska, requests information about the so-called "cat's eyes" being sent home by members of the armed forces stationed in the south seas. From intensive inquiry I cull nothing of authoritative information but most people claim they are a fossil shell usually found in the water but sometimes on the beaches. They are called cat's eyes because they have a green eye set in a brown background rimmed with white. When they are well centered and well polished they are somewhat attractive. They have nothing other than a sentimental value but as a permanent souvenir they are splendid for they need so little storage space.

Cutting them is not difficult. Since they apparently are silicified shell they are about as hard as agate. I have cut and polished but one of them and it presented no problem at all but responded well to grinding on a 220 wheel and polishing on a 220 sander followed by tin oxide on a felt buff. The shells usually are larger than a lead pencil eraser but seldom as large as a dime. If any reader possesses other information I should appreciate having it.

Last month I promised to tell how agates are colored in Idar, Germany, the center of the industry for centuries. I will give the methods for one color each month and this month I will advise how to color agates red.

Everyone has observed how agates found on the surface and colored from brown to red are white inside when cut. This is caused by the heat of the sun. If such agates are further heated in ovens they often will turn red throughout due to the iron compounds in the stone. Agate, being crypto-crystalline, can have iron compounds introduced by absorption when little or no iron exists as determined by surface coloring. The best method is to soak the agate in iron nitrate. To make homemade iron nitrate a half pound of iron nails should be soaked in four times their weight of concentrated nitric acid. This will produce a slimy mass which should be allowed to settle. The solution is skimmed and the settling process repeated several times until the liquid is clear. Agates should be washed and freed of oil and dirt and immersed in the liquid for two to three weeks for stones up to about 1½ inches thick and three to four weeks for stones up to four inches thick. Stones thicker than four inches rarely can be colored throughout.

After soaking the stone is saturated with iron nitrate which will become red when the stone is heated. It depends on your own ingenuity how this is done as the agate should be slowly heated and slowly cooled to prevent fracturing. People in the desert regions can use the sun but this is slow. People in California can store the stones in the bottom of their incinerators but in other sections of the country where these are not used probably the most satisfactory method is to bake the stones in a loaf of bread to permit slow heating and cooling. Those who have access to temperature controlled furnaces or laboratory equipment have the ideal arrangement. All heated stones are brittle and present more difficult grinding and polishing problems as they easily fracture and chip.



By RANDALL HENDERSON

WITH THE ALLIED FORCES IN AFRICA—This Sahara oasis has an abundant supply of good water. By abundant, I mean there is ample for reasonable domestic needs of the 1500 French and natives who dwell here plus enough to irrigate scores of tiny gardens along the banks of the wadi which runs through the mud and rock village.

The source of water is a vast underground reservoir fed by periodic rain storms. It requires no expert in geology to understand the nature of this reservoir. Visualize a long V-shaped valley with a precipitous escarpment on one side, a ridge of low hills on the other, and a well-sealed underground dike at the lower end of the valley where the two ridges meet. Into this basin flows the storm runoff from hundreds of square miles of desert. Here it sinks into the sand, watering the roots of thousands of palm trees and providing a constant source of cool clear water for Sahara tribesmen.

There are hundreds of wells in the oasis, with the water level at from 12 to 15 feet below the surface. The natives tell me that during long periods of drought the water level is lowered somewhat, but the healthy condition of many aged date palms is evidence that the reservoir never goes dry.

The Arabs draw their water from open wells with goatskin buckets. Those who have gardens spend many hours every day filling a storage tank above ground adjoining the well, and then watering their little patches of tomatoes, melons, onions, turnips, cabbage and wheat by gravity. It is no task for a lazy man, growing food by such methods. For our army camp we have a portable pump and a trailer tank.

Tomorrow we will start drawing water from a new well, dug by the French military for the exclusive use of the American camp. The well is in the bottom of the wadi. In the California desert a man would be crazy to dig a well in such a place. The first storm flood that came down from the wash would fill it with sand, if it didn't wash it out entirely. But the French selected the site—and they know their Sahara much better than I do. Anyway, I hope they are right for it required much time and correspondence to get the necessary cement in here by plane.

Workmen on the new well first dug a pit down to water level. Then they placed a flat disc of iron, like a huge metal washer, on the damp sand. Inside diameter of the disc was four feet. On this iron foundation they began laying the circular wall of stone and mortar. Two natives inside the ring scooped out sand, and as they undermined the wall from the inside it sank under its own weight inch by inch. Soon the diggers were in water up to their knees, then their waists and finally their chins. At that point they would hold their breath and duck under the water to bring up another spadeful of sand. We wanted a generous supply of water, so we brought in the portable pump to enable the workers to go deeper. When they reached nine feet the water was flowing into the well nearly as fast as we could pump it out and when we no longer could keep ahead of the incoming seepage we hoisted the men out on a rope and the job was finished.

We put a cement lid with padlock on the top—and as an additional safeguard we chlorinate the water.

* * *

Before I had been at this station 15 minutes I knew I was going to climb the 2300-foot escarpment along the east side of the flying field. In the gravel that covers the area I saw many broken specimens of quartz crystal, some of them with well-preserved terminal facets.

Crystals in the float means crystals in the hills—and the urge of the incurable rockhound is to start climbing in search for the mother rock. Later I learned that the army chaplain who flies in once a month to look after the spiritual welfare of the soldiers here, had taught geology before the war. The chaplain also was interested in the source of those crystals.

Together we left camp before daybreak one morning, with a few sandwiches and plenty of water. The only tool I could find was an old chisel from the camp garage. The jeep took us within a mile of the base of the range. Then the rocks that littered the bajada became too big and numerous even for a jeep. We found the source of the crystals almost before we were well started on our hike. We encountered them in a field of broken limestone boulders soon after we started up the mountain slope. The boulders were shot with vugs and seams of quartz. But we did not do so well as collectors. The rock was very hard, and our lone tool inadequate for the job of extracting the crystals.

The climb to the top of the escarpment was full of interest, despite the fact that we found little of value for a collector. This great uplift of limestone once was the bottom of an ocean. Fossil material was everywhere. One spur of the ridge was topped with a chaos of rock that made me think of those imaginary sketches of the earth's crust before there was life. It was a devil's garden where one easily could become lost among the fissures and craters that gashed the surface. Another flat-topped area was paved with petrified mud. It was so realistic I stepped out on it half expecting to sink to my shoe-tops. And yet I knew it could be nothing but rock. We were not the first to climb this escarpment. On the plateau at the top were camel trails, although I still am puzzled to know how the beasts made it up the precipitous grade. I have reached the conclusion that a camel can go anywhere a goat can travel. The reason for the camel trails was apparent. At intervals all over the plateau were the prayer shrines of devout Mohammedans. These shrines generally take the form of slabs of flagstone propped on end in a circle or semi-circle. When I first encountered them on this desert I thought they were graves, but now I know they were erected for worship. The Arabs do not neglect their prayers.

While we ate our lunch on the escarpment, we discussed the many similarities between the Christian and the Mohammedan religions. The Arabs believe in one God, Allah. Mohammed is his prophet. My houseboy, Brahme is a devout Mohammedan. He has told me about his creed: "Good Arab do not steal, no drink cognac, give plenty chop to poor neighbor, always tell

truth. Then when he die Mohammed take him up . . ." At that point Braheme's English vocabulary ran out, and he gave a sweep of his hand toward the sky. If we all had the faith of my 11-year-old houseboy, this would be a better world.

We picked our way down the rocky face of the mountain and had just reached the floor of the valley when I saw two mounds of rock that looked strangely familiar. Located about 100 feet apart were almost perfect duplicates of many Indian trail shrines I have seen on the American desert. They occur along the old Cahuilla trails that criss-cross the Colorado desert in Southern California, and in the Navajo country in Arizona and New Mexico. Arthur Woodward wrote about them in the *Desert Magazine*, January, 1941.

These on the Sahara were equal to the largest of the American mounds, nearly four feet high and 15 feet in diameter at the base. Just plain piles of small water-worn boulders, but obviously placed there by human hands. According to legend, the American Indian stopped along his trail and added a rock to the mound to insure a safe and speedy journey. The Navajo today often add a twig of juniper as they pass.

There was only one noticeable difference between these mounds and scores of others I have seen on exploring trips at home. This variation was due to the difference in the character of the rock here. These mounds were built of marine fossils of the stromatoporoidea type which cover this whole area. They were built of fossils because that was the most convenient rock to use. I hope to learn more about these mounds before I leave here.

* * *

Yesterday we said goodbye to Sergeant Melvin Maloney. We were sorry to lose Maloney. He was transferred to another station. Outside of working hours he was poet, artist and philosopher. Not one of those silent heavy thinkers, but a merry quick-witted fellow with a glorious sense of humor and a line of patter that was a sure cure for the GI blues.

In addition to his other duties, Maloney was manager of the camp Post Exchange which is open during the noon hour each day. Selling cigarettes and soap and chewing gum may be a drab business for some folks, but for Maloney it was high adventure. The walls of his tiny storeroom were hung with his paintings of palm trees and mosques and Arab maidens. He took up painting as a pastime after he came to this station. And while he passed out PX rations he entertained his customers by pointing out the crudities of his art work. His art never would win any prizes, but it was great fun for him—and it saved him the boredom which is the curse of less imaginative minds at this isolated station. Maloney was the happiest man on the post despite his bad art—or perhaps because of it.

Eight-year-old Bopepe was broken-hearted when he went out to the field to see Maloney off on the plane. He tried bravely to hold back the tears, and then hid his face in his arms when he could repress them no longer. The little Arab boy had just lost his best friend. He had been the sergeant's helper in the PX, made up his cot every day, policed his quarters for the weekly inspection and stood by with admiring eyes while his big American pal painted Sahara landscapes.

But Bopepe is still among friends. Every soldier on the post loves the bright-eyed little son of the desert. He doesn't speak English, but he understands nearly everything that is said to him. Bopepe is just one of several Arab youngsters whom we Americans would like to take home with us if it were possible.

Wadou is another of our favorites. He is 14. Wadou is a handsome lad with a sturdy pair of shoulders. He works on our native labor gang—and despite his youth and small stature does a man's share. One day I sent him out with three adult Arabs to put a fresh coating of whitewash on the stone markers along the runway. It wasn't a highly skilled task, but painting rocks was something new in the lives of these Arab workmen. I indicated what was to be done and then stood by to see how they would go about it. The older men were awkward at first, but not Wadou. He immediately became the self-appointed fore-

man of detail and soon had the job well organized. He has a pair of sparkling black eyes and a smile that would melt the heart of a snow man.

Then there is 11-year-old Braheme, my houseboy. The ages I quote are not accurate. None of these sons of the Sahara tribesmen know exactly how old they are by the calendar which you and I understand. Braheme's father owns several camels and a hundred date palms, which means he is well-to-do according to Arab standards. Braheme not only does my laundry and housekeeping duties well, but he is a sort of liaison for the American officers in their dealings with the local population. In addition to his native language and French, he has acquired a fair understanding of English during the 15 months he has been with Americans.

Braheme has had only one year of school. His home is a black tent of camel's hair surrounded by a high mud wall. His bed is a goatskin on a rough stone floor. His playmates have been the unwashed and unclothed little urchins of the dusty oasis. And yet he has wisdom beyond his years, and traits which we identify with culture—modesty, gentleness, honesty, industry, diplomacy and a fine understanding of human nature.

Don't let anyone tell you that the Arabs are an inferior race. Give them the dignity of free men, and schools for their children, and ample wages for their industry—and they in turn can teach the white-skinned races some virtues which we have neglected or forgotten.

Bopepe and Wadou and Braheme typify the best traits to be found among our neighbors in the oasis here. But my picture would not be an accurate cross-section of the primitive life in this desert without a glimpse of the ignorance also to be found.

This evening just before supper there was much chattering outside the quarters. We went out to see what was going on. A crowd of Arabs and Negroes were in the yard. The center of interest was a sullen-looking black in custody of a native policeman. The houseboys explained that the prisoner had stolen some clothing from an American officer formerly stationed here, and had just been captured. While the palaver was going on, Gabriel, our Senegalese soldier-watchman rushed out of the little room where he sleeps and started lashing the naked back of the prisoner with a heavy belt.

Of course we stopped that. Since the story was being told to us in three languages, and the natives were in a high state of excitement over the capture of the thief, it was rather confusing at first. The theft had occurred long before any of us now stationed here were on the post. When the story became clear we instructed the policeman to turn the prisoner over to the French authorities.

Later, we learned that the Negro in custody had been a slave owned by Houmedi, the local native chieftain. We also learned the reason for all the excitement among the natives. Houmedi had sent the slave over to us to be killed. "He's no good, shoot him," was the terse message.

I think Gabriel was quite surprised when we made him quit lashing the man. And I suspect the crowd was disappointed when we ordered the thief taken to jail instead of standing him up in front of a firing squad.

But we should not judge too harshly the inhumanity of these untutored tribesmen. Only 80 years have elapsed since human chattels were beaten and killed in our own civilized U.S.A.

* * *

Like all humans everywhere, the Arabs have an inherent capacity for both love and hate, for both honesty and dishonesty, courage and cowardice, generosity and selfishness, for tolerance and haughty arrogance. You and I have those same potentials in us, just as do the English and Germans and Russians and Chinese and Eskimos and all the other races of man. None of us is altogether good, nor hopelessly bad. These hereditary potentials plus environment, and the decisions we make and the will with which we carry on are the factors which shape our lives. The color of skin, the geography of birthplace, are secondary.



"WHY" OF WEATHER IS SIMPLIFIED FOR LAYMEN

Eric Sloane, artist, author, flyer and scientist, has mastered the infinitely variegated beauty and meaning of clouds and has made an unusual contribution to aeronautical literature in *CLOUDS, AIR AND WIND*. In clear, concise text, he takes the mystery out of meteorology, and by means of amusing pictorial charts and graphs and his own full-page paintings gives visual instruction in the elements of that science.

Clouds, air strata, fog, wind and rain take on new meaning and romance. The author's appreciation of atmospheric scenery and his knowledge of the subject should be a source of inspiration to young air-minded Americans.

If you have ever wondered about such weather magic as black lightning, rings around the moon, or whirlwinds; if you believe the folklore about storms and fair weather, if you have any pet theories of your own about predictions, you will enjoy and make use of Mr. Sloane's chapters on just such things, all cleverly but accurately illustrated. From his simple explanations, you will be able to look into the sky right where you are, identify the cloud formations above and predict the kind of weather that will result from their presence.

A chart of instruments for weather reading, and an easy lesson in map reading also are included. For the first time, the story of clouds and weather from the flyer's point of view is told for the layman in simple language and colorful pictures.

As proof of the fact that the book is the best simplified work on meteorology, the U. S. army air corps and pre-flight training schools over the country have adopted this new book for use in instruction.

Devin-Adair company, New York, 1941. Size 9x12½. \$3.00.—Aliton Marsh

ARCHEOLOGIST'S LECTURES AND NOTES ARE PUBLISHED

To read the works of Edgar L. Hewett is to experience vicariously a life of widening horizons, of adventuring in many fields of thought. When he wrote such books as *ANCIENT LIFE IN THE AMERICAN SOUTHWEST* he used the language of everyday, which he demonstrated could be done without sacrifice of scientific accuracy. Now his lectures and essays, which have influenced innumerable students of ethnology, are being published in a series of small books, the first of

which is *FROM CAVE DWELLINGS TO MOUNT OLYMPUS*, expressing some of his thoughts on the striving of man from darkness to light. University of New Mexico Press. \$1.50

GUIDE TO READING AND MAKING MAPS

DOWN TO EARTH MAPPING FOR EVERYBODY is a timely publication for a map-conscious public. Its clear, readable style and many diagrams and drawings bring the subject of map making and reading within reach of everyone. The author David Greenwood not only is qualified to treat the subject from the theoretical viewpoint, but from his experience in teaching the subject at Carnegie Institute of Technology, has been able to present it in a simple practical manner.

How to read maps and find exact locations of any point, explanation of latitude and longitude and Greenwich meridian, the drawing of maps to scale for ready calculation of distance, reading of the compass with meaning of magnetic north and south, are a few of the useful chapters. The different types of maps, such as relief, aerial and the various projections, with their respective uses and qualifications, are explained and illustrated.

Greenwood says the first man actually to measure the earth was a poet—Erathostenes, a Greek living in Alexandria, 200 B.C. How he happened to begin this new branch of science and how he proceeded, is one of the many fascinating sidelights, anecdotes and thumbnail biographies which are woven through the text.

Materials needed and progressive steps in map making are treated in Part Two. Third part tells the prospective map collector how to proceed.

Ralph Graeter, illustrator, is art director of Life magazine and a leading scientific artist. Three of the maps used as examples of various phases of map making were drawn for Desert Magazine by Norton Allen.

The average reader of today is confronted with an amazing array of sky maps, of geological, historical and statistical maps, weather maps of past and present, maps showing all the works of man on this earth. Greenwood's book is this bewildered person's answer to more intelligent reading.

Holiday House, New York, 1944. Size 8½x11, 250 illus., 262 pp. \$4.00.

—Norton Allen

THUMBNAIL BIOGRAPHIES OF FAMOUS AMERICAN INDIANS

Brief biographical sketches of 250 North American Indians, arranged in approximate chronological order, have been compiled by G. I. Groves in *FAMOUS AMERICAN INDIANS*, published this year by the author.

A period of almost 400 years is covered, from 1540 when the beautiful Princess Cofachiqui, ruler of the Creeks, failed to satisfy De Soto's gold seeking Spaniards with pearls, to the Crow scout Curley, sole survivor of the Custer brigade at the battle of the Little Big Horn, who died in 1923.

Readers doubtless will miss many of their favorite Indian characters; others may not recognize some of them by the versions used in this volume. For example, Red Sleeves' more commonly used "Mangas Coloradas" is not given as an alternate. Usually Cochise' son's name is given as Nachise or Nachez; yet only "Nahche" is given.

Among other Indians of the Southwest tribes represented are Ouray, the Ute chief and staunch friend of the whites; the Navajo Manuelito; Francisco who obtained release of Olive Oatman from the Mojave Indians; the Chiricahua Apache chief Geronimo, and Sarah Winnemucca, daughter of Chief Winnemucca of Nevada. 86 illus., 272 pp. \$2.00.

—Pearl Barter

LEARN SPANISH . . .

Our Latin neighbors across the Southwest border, besides sharing a common historical heritage with us, are destined to play an even greater influential role in the future. Essential to an understanding of their countries in forming postwar policies is a working knowledge of their language—easy to learn. The books below present a modern, thorough method of learning to speak the Spanish language.

CONVERSATIONAL SPANISH. Solomon Lipp, Henry V. Besso. Primer used by U. S. Army and Navy to teach conversational Spanish quickly, easily. Practical instruction, spiced with amusing cartoons. Vocabulary, technical expressions, facts and figures about South America, list proper names. 168 pp **\$1.25**

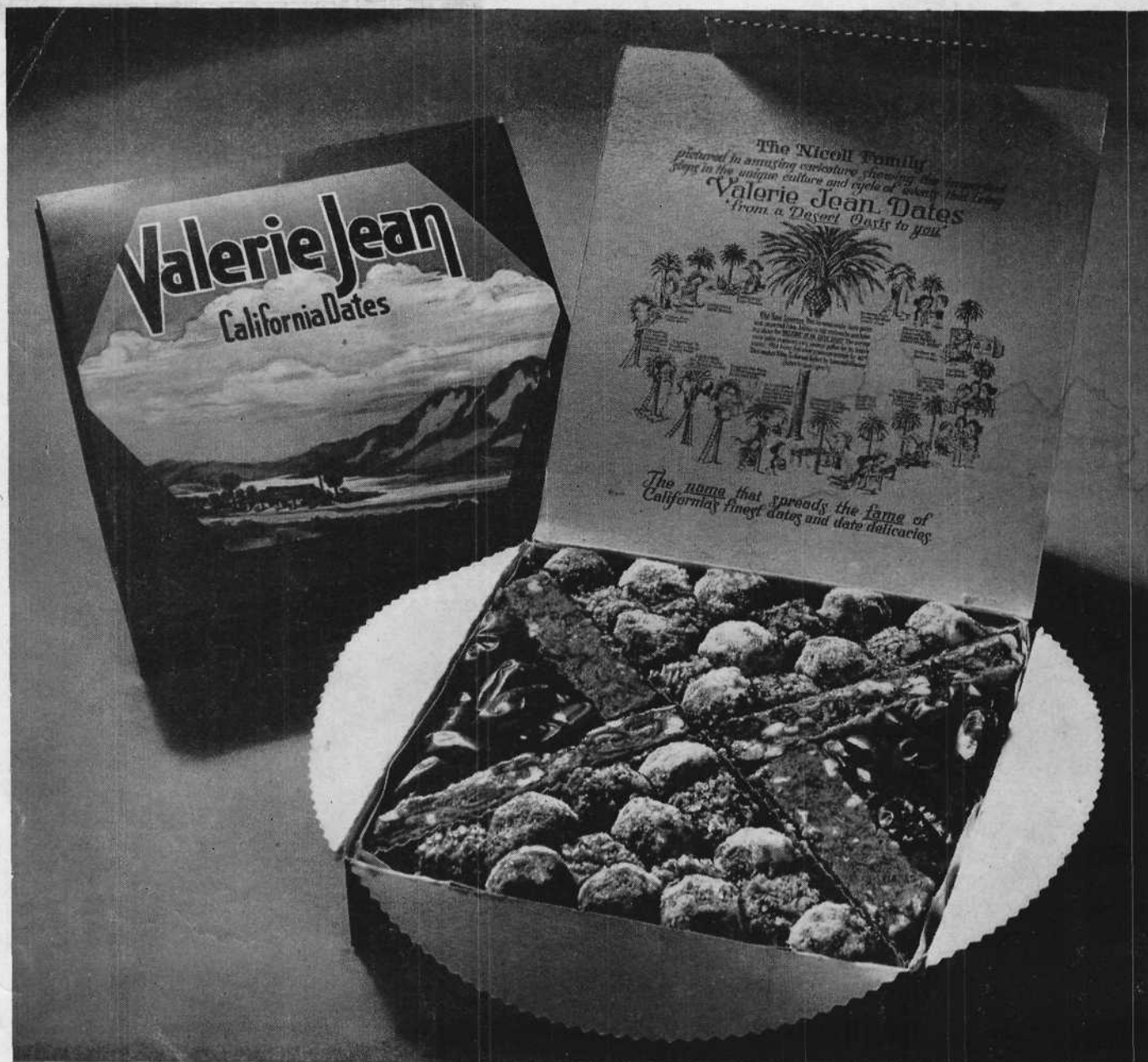
CONVERSACION. Besso, Lipp. Advanced text for use with preceding primer. Elements of grammar. Brief, practical conversations. Differences of pronunciation and dialects in Latin-American countries. Technical and general vocabularies, biblio., general information, grammar compendium. 294 pp **\$1.50**

FOLLETT SPANISH DICTIONARY. Joseph G. Fucilla. Spanish-English, English-Spanish dictionary containing latest scientific, commercial, technical and military terms plus complete key to pronunciation. 332 pp **\$2.00**

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